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CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

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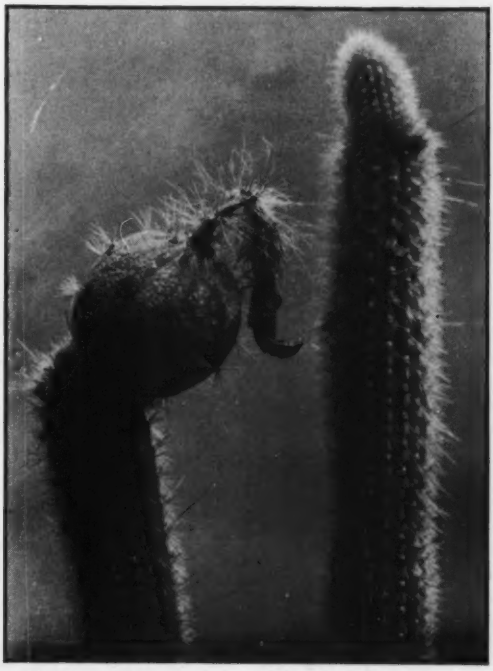

FIG. 59. *Arthrocereus rondonianus* fruit. See pg. 106.

CACTUS AND SUCCULENT JOURNAL

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An Arthrocereus—Fruit

Since my article "The Genus Arthrocereus" was written in C. & S. J., 1948, 1-2, another *Arthrocereus* was described in my publication "New Cacti from Brazil" (Archivos, Bot. Gard., Rio de Janeiro, 22-6-49): *Arthrocereus mello-barretoi* Backbg. et Voll, which has still stouter flower-tubes with strong and dense hairs. *Arthroc. rondonianus* Backbg. is in the middle between the forms with slender tubes and only a few hairs, and *Arthroc. mello-barretoi.* The inner organization of the flowers is the same in all species. Hitherto no fruit was exactly observed in this genus.

Here I am showing the first photographs of the fruit of this genus. The fruit of *Arthroc. rondonianus* has distant tufts of hairs, which are more bristly, stiffer than the hairs on the tube. The fruit is not splitting, rather thin-skinned, with greenish flesh; the fruit was persisting on the plant for about 6 months. The seeds are rather small, dull and pitted; many in a fruit. The dried flower is persisting on the fruit, according to the above mentioned article in C. & S. J.

CACTUS AND SUCCULENT SHOW, MAY 20th, 1951

On Sunday, May 20, the Cactus and Succulent Society of America, Inc., under the auspices of the Research Board, held an open, noncompetitive cactus and succulent exhibit at Beahm's Nursery, 2686 Paloma St., Pasadena, Calif.

All members and friends of the Society, within traveling distance were invited to attend and to exhibit plants. Fourteen exhibits were presented and the crowd enjoyed themselves very much as the hybrid Epiphyllums were in bloom and made quite a showing in themselves.

Many persons brought their lunches and enjoyed themselves while looking at the exhibits. The showing remained open from 10 o'clock a.m. until 4:30 p.m. and a goodly turnout resulted. Sherman Beahm gave an interesting talk and demonstration on hybridizing and the grafting of cacti.

There were several exhibits presented by newcomers who had never exhibited before and many fine plants were shown. J. R. Brown gave an award to the most outstanding exhibit which was won by Mrs. Thompson. of Thompson's Succulents, whose dish garden showing was clearly the most striking exhibit shown.

There were door prizes and everyone seemed to be well pleased and went home happy and anxious to do it again.

ETHEL RUSH, *Secy.*

CACTUS EXHIBIT

A "Desert Garden" was displayed by Mr. and Mrs. Chester C. Moorten of Palm Springs, Calif., at the California International Flower Show in Los Angeles, March 3 through 11th, 1951, which was reported to have attracted more than 285,000 spectators.

This was a featured exhibit in the Educational Department. The size of the space filled was about 20′ x 24′. Slim and Pat Moorten designed and supplied all the materials and planted a desert landscape done in perspective, backed by a colorful desert sunset painting on canvas measuring the full 24′ by 9′ high.

The 86 varieties were all garden-size specimen plants, botanically labeled and representative of cacti and succulents from all over the world. There was a nine foot Joshua tree and many of the plants were in bloom which added to the color and interest.

The Moortens have supplied cactus exhibits to many of the biggest shows throughout the country for over ten years. They are members of the California Cactus Growers Association, landscape designers and desert plant specialists.

NEW LISTS

Rocking Horse Cactus Gardens, 2415 W. Glenrosa, Phoenix, Arizona, announces their Retail Price List for 1951. It includes many hard to get collector's items. Send for a copy, free.

Johnson's Jubilee Cactus Handbook is now available (more about these gardens in the next Journal) for 50c. Send to Johnson Cactus Gardens, Paramount, California.

PRINCIPLES OF PLANT REPRODUCTION

By R. C. PROCTOR

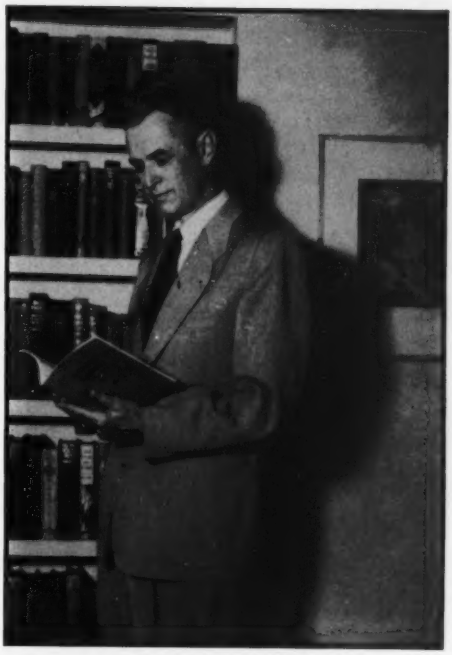

FIG. 60. R. C. PROCTOR

Introducing the author: Mr. Proctor has become well known for his color photographs of Arizona cacti. His work has been shown in most of the national publications and those of England. His 16 years experience with desert cacti inspired his research in plant propagation. He does not claim to be an expert nor does he claim to present any new theories. He frankly admits that his hobby has taken him to many sources for information which he now passes on to others in words that they too may understand—S. E. H.

* * *

Once I treated myself to a commercial tour into the cactus desert of Arizona on a rubberneck bus. You know, one of those vehicles with a driver that knows everything along the route, has all the natural sciences under his hat and supplies all the answers—or rather the tourist passengers think so. When this particular bus pulled up to a stop beside a group of saguaro (sà wär′ ō) cacti the driver directed our attention to one large plant with turned up arms and, in a learned manner, explained the life history and habits of the săg wär′ ŭ "male" cactus. After a few asinine questions from the enchanted gawks, of the otherwise intelligent crowd, our attention was then directed to the nearest armless saguaro and was told "here is the 'female' of the species."

In those days, about sixteen years ago, I didn't know a thing about the love life of a cactus, and still don't, but it didn't take a college professor to understand that "that" bus driver (conductor of the tour, if you please) was a master of biology-of-homo-sapeins — the cinema brand — but knew little or nothing about cactus plants. However, I must admit that his yarn, livened with cute remarks about romance during the cactus mating season, impressed me considerably. It implanted the germ of many questions that could be answered only by a study of "angiosperms" in general botany.

Therefore, it is my belief that one who is seriously interested in cactus plants can gain a broader understanding of their life processes by reading at least one textbook on general botany or a layman's book on the story of plants. The structure of cacti is fundamentally the same as in other flowering plants—even some of the cactus books tell us that, or words to that effect.

The ability to store water, the areoles and spines and the tendency to grow leafless—or the complete absence of leaves—are distinguishing characteristics of cactus plants, but in the sense that no two individuals are exactly alike they do not set the cacti apart from other angiosperms (flowering plants) except for classification; and that only because we humans must have everything named or numbered.

All types of plants, to meet the conditions of life, are endowed with the qualities that enable them to solve their respective environmental problems and to evolve . . . each in its own fashion; a fashion that can be altered with every drastic change in its environment or conditions that are imposed upon them in cultivation.

However, to get the most benefit from a textbook or a cactus book one should have a few plants under observation—cacti in our case—or at least a speaking acquaintance with them. Then what is absorbed through reading would merely open one's eyes to what he already has seen and knows about a living organism, such as a cactus, but had never considered the full nature of its existence. At any rate, that has been my conclusion and, as a matter-of-fact, I have delved into several textbooks for the fundamentals of this article.

Sex and Reproduction

Most of the highest developed types of plants

have special cells in their stems, joints, roots, and fruit coverings, that retain their dividing ability for an indefinite length of time. When a portion of a plant that contains such cells is removed and planted under favorable conditions it will sprout roots and form a new plant. We all know what happens when the joints of an Opuntia fall to the ground. In the cases of *Opuntia Engelmannii* and *Opuntia Bigelovii* an entire region may be overrun with new plants that arise from the easily detached joints and fruits. Segments from most types of jointed cacti can be rooted. An Echinocereus can be cut in half and the two parts rooted to make two plants. The tuber of *Peniocereus Greggii* can be cut into sections, the cuts allowed to heal, and the sections planted will produce individual plants. In fact, I personally know of no cactus that cannot be propagated vegetatively—some are of extremely slow growth, of course.

The method of propagation by the vegetative process is also common to a great many types of plants outside the cactus family and all plants thus formed from the same, single parent, belong to a group of their own that is referred to as a clone. Many cactus plants in nature, such as the prickly pears, belong to the same clone—as well as a lot of Echinopsis pups (off-sets) that have been distributed far and wide.

FIG. 61. Propagation by the vegetative method is favored by *Opuntia Bigelovii*—Silver Cholla—hence the flowers and plants are all closely alike. The joints that fall to the ground await the rains and take root. Seldom are plants propagated by seeds for the few fruits also put forth roots. All Opuntias spread fast by the vegetative method.

The essence of sexual reproduction involves the union of two germ cells (gametes) that form one asexual cell. Such a cell gives rise to the perpetuation of many types of plants by the vegetative process. Although most plants continue to reproduce themselves by sexual means many wild and domesticated types have lost this ability, but they are able to propagate their kind indefinitely by some vegetative method. Cacti are able to reproduce their kinds by both methods.

Reduced to the simplest terms, sex and reproduction are the fusion of two masses of protoplasm that continues to grow as a single organism and, like all living organisms, it is exposed to some factor that finally kills it off. In the meantime it may produce offspring to perpetuate its kind by the vegetative method and they last as long as its environment is more or less stable. The resulting offspring, or plants, will carry over all the characteristics of the parent plant, and all of them belonging to the same clone, including succeeding generations, will be very much alike except where environment influences come into play.

But when two gametes come from different plants there is a stimulating effect upon the resulting offspring—or variations, in this case. Therefore, nature seems to favor propagation through cross-fertilization rather than self-fertilization, especially where the species is common to a wide variety of habitats of different environments. The sexual method, or flower and seed process, best serves the purpose of propagation until a so-called "perfect type" is established and in a relatively stable environment. Then follows the vegetative process—according to one theory.

Plants reproduce true to type, barring mutations, by the asexual, or vegetative means, in large numbers, quickly and economically—the Echinopsis offsets and Opuntias, for instance. Citrus fruit growers and hybridizers of Epiphyllums learned long ago the value of this method in producing and perpetuating certain desired types. The importance of propagation by the vegetative method in agriculture and horticulture is that it ensures a uniformity among offspring plants. But such plants would not remain stable, nor even survive, under most conditions that prevail in natural environments.

It appears that inbreeding—that is, self-fertilization—is frowned upon by nature because the subsequently fixed combination of characteristics deteriorate with each descending genera-

FIG. 62. To get the most from a textbook or cactus book one should have a few live plants for observation. The potted plants are brought indoors during excessive rain, or freezing weather, and returned to their same position in the light—to encourage flower buds.

tion. It also results in very poor plant specimens and, ultimately, the extinction of the line. All species and their variations require an introduction of new blood; it is the law of variation to improve the types, for only improved types can survive in this world of changing conditions.

But that is not to infer that inbreeding of a line is not good. Indeed, when a generation of plants of the same species are crossed, or recrossed with plants of their descending generations, the results could be very good—also very bad. In fact, a great many of the fine old lines of food producing plants and highly esteemed domesticated flowers are the products of scientific inbreeding or, more properly phrased, "line breeding."

The point I am driving at is the folly of trying to produce offspring by the hand method of self-fertilizing a cactus flower or the cross-fertilization of two flowers of the same plant. While it is not wholly impossible, in nature the practice of self-fertilization is on the decline and with some species it is entirely out. But if one can do it by his own skill, the resulting fruit, if any, will most likely be of an inferior quality and the seeds, if any, are not apt to be fertile. Finally, if there are offspring plants there is little chance for them to be anything but degenerates. There are exceptions to all rules, and there are lots of contradictions in nature, so one might be just lucky enough to produce a good offspring from self-fertilization of his one and only little cactus.

As an illustration, I have about twenty single plants of various species that flower well and the bees visit them often enough yet never has one plant produced a single fertile seed. Fruits? Yes—but puny little things. Self-pollination by hand produced no results either. It takes at least two plants of a kind to ensure effective fertilization, by cross-pollination, to develop healthy fruits with fertile seeds. Other cactus species in my yard represented by two or more plants seldom fail to produce heavily seeded fruits from all their flowers; nature very definitely encourages cross-fertilization in the cactus family.

Genes: Transmitters of Characteristics

When two gametes are united by conjugation, the union thus formed is called a "zygote," or fertilized egg. Each of the gametes contains its own unique set of genes, and every fertilized egg of every living organism, whether it be a cactus, a kitten, or a crocodile, normally contains two sets of genes—one set for each of its parents. It is the business of these genes to transmit to the new fertilized egg the potentials for assuming certain characteristics of the parents. And it is the sum of all the genes and

other substances, thus transmitted, that give to an organism its total inheritance.

For illustration, let us take a cactus: One gene may be for hair-like spines while its mate may not: another may be for yellow color and its counterpart for a different color. A gene may carry the potentials for strongly fragrant flowers yet its mate developes odorless ones; some genes dominate their recessive mates.

The genes combine in string-like fashion to form what is known as chromosomes, and each chromosome is made up of genes from two different parents. Any one chromosome may or may not have come from any one or all of its sets of parents, grandparents, great-grandparents and the sixteen great-great-grandparents—and so on until its original gene or genes is reached. This is responsible for the occurrence of many irregularities in the offspring.

A parent to several offspring transmits different characteristics to each of them, and this is done through the gametes. Each gamete receives a different combination of genes. And even though the fusion of two gametes from the same two parents may produce many seeds, each seed will contain its own peculiar combination of genes; offspring from the same parent, by the sexual method of propagation, are never exactly alike.

When a sexually produced individual dies without having been vegetatively reproduced its unique collection of genes will never again be united. On the other hand, when an individual is reproduced vegetatively the genes are duplicated and transmitted intact to the offspring; hence the resemblance between parents and offspring. And so long as the genes are not affected by change, all the forms thus reproduced are able to remain stable throughout succeeding generations so long as environmental conditions and other factors permit.

Now let us try to clarify Gregor Mendel's law of heredity, or the basic principle of it:

When two gametes are produced by similar organisms the resulting offspring should resemble both parents to a considerable degree because the same pairs of genes have been brought together again. Suppose we use a little imagination and take cactus plants for illustrations. Gregor Mendel used garden peas in his experiments but the variable *Echinocereus pectinatus* will serve for our purpose. When the male gametes of a true form of *Echinocereus pectinatus,* or lace cactus, are crossed with the female gametes of another true form of *E. pectinatus* the resulting offspring will be more true types of *E. pectinatus* with the typical rose-pink flowers and pectinate spines.

In many cases of widely different plants successful crosses can be effected; resulting in what are known as hybrids. When a plant having red fruit is crossed with one having a yellow one, a lemon with an orange or an Epiphyllum with a Heliocereus the hybrid may be more like its male parent than its female, or its female parent more than its male—or it may display all or some of the characteristics of both. A new characteristic may appear in one or all the hybrids, which often happens, and then a new variety or type of organism is born.

FIG. 63. *Ferocactus acanthodes* growing in its habitat shows seedlings at the base of the plant and a crop of offsets growing from the top of the plant. The outcropping of new shoots was due to bruises caused by man or animals. This method of forcing vegetative shoots is practised by commercial growers who remove the offsets and re-root them.

However, when two individuals are crossed we can only make a guess as to what their offspring will be like, based on the law of averages, because a gene misbehaves now and then, leaving its place in a chromosome or vanishing completely. Such behavior on the part of one or more genes would upset any forecast that is based on the usual combining, separating and recombining of the genes with each generation.

But barring such behavior on the part of the genes let us just suppose what the outcome would be, and should be, when two similar plants are crossed that differ in only one re-

spect, flower color. One parent, let us assume, has the blue producing gene and the other parent has the red one and neither gene is dominant over the other. The offspring of this cross would bear purple flowers owing to the fact that one gamete contained a blue gene and the other gamete a red gene. When the two gametes joined to form the fertilized egg the egg received one blue gene and one red gene; blue and red make purple.

Now let us go a little further with Mendel's law of heredity, and suppose that our flowers, this time, are pink—bearing in mind that pink is a color we get by mixing red with white in equal parts. Any two plants we choose to cross will produce the same effect, but let us suppose that each of these two parent plants will produce four gametes: Two male pollen grains containing white genes and two containing red genes will come from the brother—while two ovules containing white genes and two containing red genes will be provided by the sister. After all the female gametes have been fertilized by the male gametes four seeds will develop that may grow into flowering plants. One of these plants will bear red flowers since one red pollen grain fertilized a red ovule. Another of these plants will produce white flowers because two white genes got together in one egg. Two plants will produce pink flowers because one red male and one white female were joined, and a red female fused with a white male.

In this illustration the color genes have been separated regularly in strings of chromosomes when the gametes were formed. Their recombination in the fertilized egg, or zygote, took place when each new generation was formed during sexual reproduction—or cross-pollination—and without losing their identity. This only illustrates the basic principle of Mendel's law of heredity which has been carried further to many combinations and recombinations of genes for various color and other effects. But complications arise when one or more genes are dominant over its mate, therefore colors and forms do not always turn out according to formula, and hybrids are not always intermediate forms between their parents; they often resemble only one or neither of them. Innumerable combinations of genes and chromosomes are constantly taking place both naturally and by man's artificial means, resulting in a mulitutde of natural variations within the various species, and many useful domestic hybrids. The peculiarities of every type of organisms are being changed at every detour and crossroad along the highway of life, with each generation. While the offspring and their parents might be in many cases very similar to each other they are never exactly alike.

Moreover, we cannot determine the ancestry of a plant or animal by its appearance only. We may think that it is pure this, that or the other, but it may have dominating or recessive genes, and some of its genes may be partial or complete. Therefore, the external appearance of a plant or animal may be different from its genotype. We can only be sure of the genetic constitution of an organism by propagating it by the vegetative method or breeding it from pure parents—if we can determine what are pure parents and to what degree they are pure.

To be continued

International Congress for Succulent Plant Research at Zurich

September, 1950

DECISIONS

The participants of the Congress were in accord with:

(a) Co-operative study-work on an International basis is desirable and to be fostered,

(b) Immediate action be taken to create a financial basis for such co-operative work,

(c) Mr. A. J. H. Buining, Holland, be given the mandate to contact the representatives of the botanical section of the "International Union of biological Sciences" so as to secure our acceptance as a Special Commission and the availability of the necessary financial means, (UNESCO),

(d) Any linking up with the "International Union of biological Sciences" shall not preclude attempts to link up with and obtain support from similar Institutions,

(e) An International Study Organization be set up based "in principle" on the lines of the attached schematic drawing submitted by Mr. H. Krainz, starting from the word "Forschungsgemeinschaft" in section 2, but excluding the suggestion for a commission on system and nomenclature (see attached scheme),

(f) Those present declared themselves to be the Founder Members of a new Organization to be called:

INTERNATIONAL ORGANIZATION FOR SUCCULENT PLANT STUDY.
ORGANISATION INTERNATIONALE DE RECHERCHE SUR LES PLANTES SUCCULENTES.
INTERNATIONALE ORGANISATION FUER SUKKULENTENFORSCHUNG and subsequently referred to as IOS.

The members of IOS unanimously agree that:

1. IOS shall make every endeavor to increase the number of its members both in regard ot individuals and organizations.

1. The first task of co-operative work shall be the compilation of an up-to-date generic list for Cacti and that this work be entrusted to Prof. Dr. E. Werdermann, Berlin and Mr. Hans Krainz, Zurich. A subsequent task shall be the compilation of an index of species (including the syonoyms). After completion and adjustment of these lists by others able and willing to cooperate the ultimate list shall be sent to all appropriate parties wanting them.

3. The card-index of Mr. H. Jacobsen, Kiel, which is already in existence, shall form the basis of lists of

FIG. 64.

Delegates to the International Congress at Zürich (1950) Left to right: DR. SCHLITTER, Bot. Gard Zürich; PROF. DR. J. A. HUBER, Dillingen-Donau, Germany; PROF. DR. BUXBAUM, Judenburg, Austria; behind the latter—PROF. D. REGEL, Switzerland; DR. G. W. HERTER, Switzerland; PROF. DR. A. U. DANIKER, Dir. Univ. of Zürich; PROF. DR. E. WERDERMANN, Berlin-Dahlem; SR. JUAN PANELLA, Barcelona, Spain; A. F. H. BUINING, Mamersveld, Holland; J. A. JANSE, Hillegom, Holland; H. M. ROAN, Adel, Leeds, England; DR. W. CULLMANN, Marktheidenfeld, Germany; H. KRAINZ, Zürich; W. KESSELRING, Darmstadt, Germany; E. GLAUSER, Luzern, Switzerland; H. JACOBSEN, Kiel, Germany; PROF. DR. G. SCHWANTES, Kiel, Germany; M. J. MARNIER-LAPOSTOLLE, St. Jean, Cap-Ferrat, France; in back next to last MR. GERBER, Zürich; MR. L. F. VATRICAN, Monaco. Photo by A. J. A. UITEWAAL, Amsterdam, who was also a delegate.

generic and specific names for succulent genera other than Cacti, Mr. Jacobsen already having agreed to prepare the necessary lists for further submission. These lists shall be treated in the same manner as the Cactus-list mentioned in resolution 2.

4. An early task of the IOS shall be the publication of a REPERTORIUM PLANTARUM SUCCULENTARUM.

5. Citations of new descriptions of succulent plants published since January 1st, 1950, shall be published periodically by the "National Cactus and Succulent Society" (Gt. Britain).

6. The seed collection already established in Zürich shall be used by the IOS and its members for scientific purposes and every effort shall be made to augment and supplement this collection. Additional centres shall be created and supported as conditions permit.

7. Members of the IOS undertake to secure and forward one copy of any of their new publications to the appropriate Editors of the lists of generic and specific names as well as to the "National Cactus and Succulent Society."

8. In order to make new descriptions which have been published by authors outside the IOS available as set out in 7). Members of the IOS undertake to procure and forward such descriptions, in so far as they have been published in their own respective countries and have been brought to their notice, in the same manner as set out in 7.

9. It is recommended that importers and authors send cuttings of any new species for cultivation *under glass* to:

(a) Städtische Sukkulentensammlung, Mythenquai 88, Zurich 2 (Switzerland).

(b) Botanischer Garten, Amsterdam (Holland).

(c) Botanischer Garten, Kiel (Germany).

And for *open-air* cultivation to:

(a) Jardin Exotique de Monaco (Monte Carlo) (from 1952 only).

(b) Jardin Botanica "Marimurtra" Blanes, Prov. Gerona (Spain).

(c) Mr. J. Marnier-Lapostolle, "Les Cèdres," St. Jean, Cap Ferrat (Alpes Maritimes) France.

And/or any other centres to be recommended later.

10. Members of the IOS shall endeavour to ensure that all "type" material is in due course placed in the care of Scientific Institutions and that the IOS is informed of any such ultimate location.

11. In each country the appropriate Society or Institution shall nominate one member of the IOS and of dealing with day to day business of the IOS.

12. Delegates of the IOS are requested to keep each other informed regarding new publications and recent developments.

13. Delegates of the IOS are enpowered to prepare in co-operation with each other, any business for consideration at the next Congress.

FIG. 65. The Sea Urchin Cactus is more appropriate than Sand Dollar Cactus.

DESERT PLANTS FOR THE CURIOUS COLLECTOR

By MONTAGUE FREE

Text reprinted from "The Home and Garden."

The instinct to collect things seems to be inherent in the human race. This sometimes finds its outlet in hoarding a pile of junk in the attic or in collecting match-book covers, buttons, stamps, or house plants. A hit-or-miss assemblage of house plants, while laudable enough, is not so absorbingly interesting to a real collector as a homogeneous plant group in which he can specialize. The group chosen is determined by its personal appeal and by the facilities available for growing it. If none but north windows are usable for plant culture, the first choice is likely to be—yes, you've guessed it—African-violets, of which there are scores of varieties. Other possibilities for north windows include: Bromeliads, Ferns, and (especially if a cool room is available) the many forms of English Ivy. In east and west windows Begonias, Gloxinias, or Impatiens in many varieties could be accommodated. South windows are a "natural" for Cacti and other succulents (plants with fleshy stems or leaves, in which water is stored as insurance against a dry season). However, no one can hope to assemble a collection of *all* the Cacti and succulents suited to house culture —there are far too many of them—but the groups within the larger groups have members which are sufficiently numerous and diversified to fill the needs of the most avid collector. The kinds most valuable when space is limited are those which never attain any great size or those which are attractive when young and grow so slowly under house culture that they never reach unwieldly dimensions. It is with these diminutive species that this article is largely concerned.

First, let's take a look at the Star Cacti. These are species and varieties of Astrophytum (*Astro,* starlike; *phytum,* plant), a small genus native to Mexico. Some of the species are spineless; in others the spines are sparsely produced and not sufficiently formidable to cause concern. All of them are interesting, either in the form of the plant body, or in the markings thereon. The Sand Dollar (*A. asterias*) forms a spineless, flattened body about an inch high and three times as wide, with seven or eight ribs, and looking, when viewed from above, like a pale green pie (can you imagine!) divided and ready to be dispensed. The Bishop's Cap (*A. myriostigma*) also is spineless but more or less globular in shape, 2 to 3 inches across, usually with five very prominent ribs. The body is thickly covered with white spots which, when examined under a lens, are seen to be tufts of woolly hairs —in the botanist's jargon, they are floccose. This feature is more prominent in the Ornamented Bishop's Cap (*A. ornatum*), in which the tufts are fewer but larger. This species has curved, reddish spines springing from snowy, cushionlike areoles (small areas) widely spaced along the midrib. This may very slowly reach a foot in height.

Although there are seven or eight varieties listed of each of the two last named species,

FIG. 66. The ornamented Bishop's Cap.

they are not easy to find, and you will want other groups to make a rounded collection. Admirable companion pieces are to be found among the Chin Cacti—Gymnocalycium. The Striped Chin Cactus (*G. Mihanovichii*), a reddish brown hemisphere with rippled ridges and pale lines extending into the valleys. The hair of the areoles lops over in many cases, giving the effect of a Santa Claus' beard, an uncombed hoary poll, or a worn-out rope tug bumper—depending on the quality of one's imagination. There are several other species available from dealers specializing in Cacti.

Under favorable conditions all of the above are capable of blooming while they are still quite small, but even if they never bloom, they are beautiful.

If you have room for a few more midgets, consider the Pincushion Cacti. These are species of Mammillaria, a genus in which the plant body is covered with teatlike tubercles. There are upwards of 200 species—enough to keep anyone busy with this group alone. A favorite of mine is the Powder Puff Cactus (*M. bocasana*), a globular form which gets to be about 2 inches across. It has slender green tubercles set on a pinkish body which is almost obscured by the tufts of silky hairs and the hooked brown spines attached to the tips of the tubercles. One of the easiest of all to grow is the Golden Lace Cactus (*M. elongata*). This has about sixteen slightly curved yellow spines radiating from each tubercle, with a larger but still slender, red-tipped straight spine sticking out from the center of some of them. This is a clump-forming species, and the tiny nubbins seen at the base of the plant pictured may be expected to grow 4 inches high to begin the clumping effect.

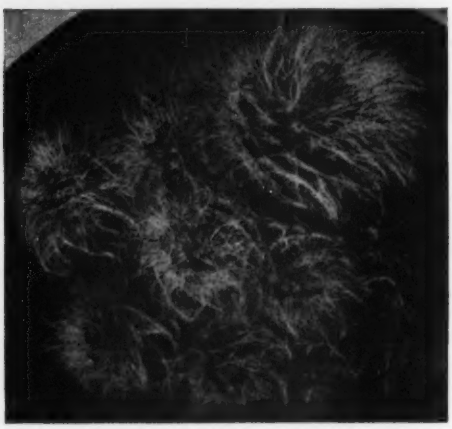

FIG. 68. The Powder Puff Cactus.

FIG. 67. The striped Chin Cactus.

Although the Old Man Cactus (*Cephalocereus senilis*) is said to be capable of attaining a height of 40 feet, it is of slow growth, and young plants, already with that senile look, can appropriately be included in a collection of small Cacti. The tufts of wiry, shaggy, white hair covering the cylindrical plant body led to

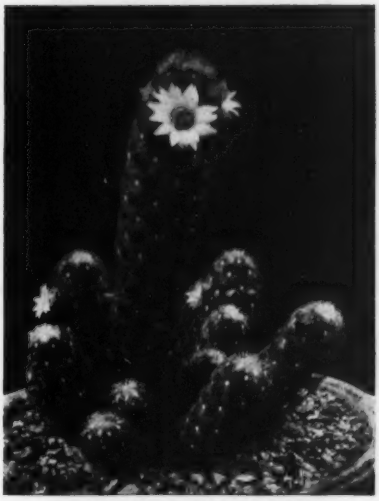

FIG. 69. The Golden Lace Cactus.

the English and scientific names (*Cephalo,* head; *senilis,* old or hoary).

The plants listed above represent only a very small part of the hundreds of ornamental Cacti which can be grown and displayed, either permanently or for a while, in 2- to 3-inch pots. Others can be selected and ordered by mail from the catalogues of specialists, or they can be assembled as a result of a continuing hunt through the shelves of local florists or in the nickel-and-dime stores. Unhappily, in the latter case the names are often lacking.

FIG. 70. Old Man Cactus.

Those who have an aversion to spines and thorns can find plenty of innocuous species among the small non-Cactaceous succulents represented by several distinct plant families. Some of the most interesting of these belong with the Fig-marigolds, a group formerly known as Mesembryanthemum, which in recent years has been split up into more than a hundred genera. The one most commonly offered by the local florists is the Tiger's Jaw (*Faucaria tigrina*), whose pairs of leaves have recurving teeth. The flowers have a resemblance to Daisies, and may

FIG. 71. Tiger's Jaw.

be carried by plants small enough to be grown in 2-inch pots, are of brilliant, glistening yellow and upwards of an inch across. These are followed by fat and fleshy (when unripe) fruits which accounts for the "Fig" part of the English name of the group.

The "Windowed Plants" are among the most interesting of this fascinating family. It is reported that in their native home, the South African deserts, they grow with their leaves buried in the soil with only the tips visible. In order to allow them to carry on their functions, light is admitted to the chlorophyll (green coloring matter) through translucent areas (the windows) situated at the leaf tips. The example pictured is known as Baby-toes (*Fenestraria*

FIG. 72. Baby Toes.

rhopalophylla), and the windows can be seen as dark patches at the leaf tips. Its white flowers are almost 2 inches across.

Others of the Mesembryanthema show protective mimicry in their resemblance to chips of granite or water-worn stones and are collectively

FIG. 73. Living Rock

known as "Living Rocks." One of them is the Boiled Egg, or Split Rock (*Pleiospilos Nelii*). Its absurdly corpulent, stone-like leaves are arranged in pairs, each pair at a right angle to its immediate neighbors. Its flowers are yellow, up to 3 inches across.

The Orpine, or Stonecrop, family has numerous members suitable for culture in small pots. Many of these are found in the genus Crassula, which includes the well-known Jade Plant, a species far too large and coarse for our purpose. A diminutive kind is the one known as Rattlesnake Buttons (*Crassula teres*), with fleshy, concave leaves which are gray-green with deep green or bronze spots and have translucent margins. These are arranged in four overlapping

FIG. 74. Rattlesnake Buttons.

ranks forming an almost cylindrical column. A plant of this species in a 2-inch pot is shown here. Of entirely different appearance, though its leaves are also four-ranked, is the plant sold as Giant's Watch-chain (*C. lycopodioides** variety *imperialis*, a name not listed in *Hortus Second*). This has comparatively thin, bright green, overlapping leaves arranged with geometrical precision to give a squarish effect to the branches. This, as it grows larger, is likely to

*See *Succulents for the Amateur* Fig. 40.

FIG. 75. Airplane Plant.

have a rather untidy effect, so cuttings should be taken at intervals to provide a succession of small, less sprawly plants. The Airplane Plant (*C. falcata*) has gray leaves which in form look like those of an airplane yet to be designed. If grown along in a 5- or 6-inch pot, it will produce its clusters of brilliant crimson flowers. Other interesting Crassulas include: Necklace Vine (*C. perforata*) and Arab's Turban (*C. hemisphaerica*).

FIG. 76. Baby Joshua Trees. (*Sedum multiceps*)

Those who like to grow a lot of different plants and have but little room in which to do it will find that collecting these small plants, which can be accommodated for long periods in 2- or 3-inch pots and offer much to fascinate the gardener who will observe them closely, is a most absorbing hobby.

INTERESTING TRAVELOGUE

Brazil and Its Columnar Cacti—Dr. E. Werdermann. This travelogue is written in a very interesting style and depicts the hardships of a cactus collector who ventures off the beaten trail. The human interest and breath-taking experiences are intermingled with the descriptions of the many cacti that he found. Among the chapter headings are: Through Northeastern Brazil, In the Wilderness of Pernambuco, We grope our way by land to Bahia, In search of Cacti in the heart of Bahia, Retrospect of the Investigation of Cactus flora in Brazil, The Occurrence and geographical distribution of Cacti in Brazil in relation to soil and climate, Regarding the collecting and shipping of live cacti, Cactus Herbarium, Survey of the Brazilian columnar Cacti, Index. Cloth bound $3.00.

132 West Union St., Pasadena, Calif.

SOME RESULTS OF TWENTY YEARS OF CACTUS RESEARCH[1]

By CURT BACKEBERG

PART II

An annotated list of my new genera, species, varieties and combinations (continued)

N. reichei (K. Sch.) comb. nov. Syn. *Neoporteria reichei* (K. Sch.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 261. This is Schumann's *Echinocactus reichei* which had bristles on the upper tube. No specimens are now extant. The so-called *"E. reichei"* of collections, without bristles on the tube, has been described under *Reicheocactus.*

N. rostrata (Jac.) comb. nov. Syn. *Chilenia rostrata* (Jac.) Backbg., 1939, Kakteenk.: 82.

106. *Horridocactus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. Type: *Cactus horridus* Colla. This group is characterized by rotate flowers, short tubes with a little felt in the areoles and a few bristles above, and by nearly naked fruits.

H. curvispinus (Bertero) Backbg., 1940, Kakteenk: 50-51. Possibly synonymous here is *Horridocactus froehlichianus* (K. Sch.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 262.

H. heinrichianus Backbg., in Backeberg & Doelz, 1942, Kakteenk.: 8-9. A species with rather small, yellowish flowers.

H. kesselringianus Doelz, in Backeberg & Doelz, 1942, Kakteenk.: 4.

H. horridus (Colla) Backbg., 1940, Kakteenk.: 50-51. Syn. *Pyrrhocactus horridus* (Colla) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 264. *Echinocactus tuberisulcatus* Jacobi, 1856: 108. *Echinocactus soehrensii* K. Schumann, 1901: 75.

H. nigricans (Linke) Backbg. & Doelz, 1942, Kakteenk.: 4. Syn. *Chilenia nigricans* (Linke) Backbg., 1939, Kakteenk.: 82.

107. *Reicheocactus* Backbg., 1942a, Cact. Jahrb. DKG.: 39, 76. Type: *Reicheocactus pseudoreicheanus* Backbg. *Echinocactus reichei* K. Sch., as the now destroyed herbarium material in Dahlem showed, was not the plant known generally under this name in collections, for Schumann's species had bristles on the flower and probably represented a species related to *Neochilenia napina.* The identification of the *"Echinocactus reichei"* of horticulture with *Lobivia famatimensis* Speg., as was the opinion of Werdermann and Doelz, 1938, is in error. It is *Lobivia* neither in habit nor in flower. Its flowers resemble those of *Neochilenia* very closely but lack bristles and have a very woolly tube. The strange little tubercles and spines also resemble those of *Neochilenia napina,* but are unknown in *Lobivia.*

R. pseudoreicheanus Backbg., 1942a, Cact. Jahrb. DKG.: 78. Syn. *Chilenia reichei* Backbg., 1939, Kakteenk.: 82, non *Echinocactus reichei* K. Schumann, 1903: 110.

108. *Neoporteria* Br. & R., emend. Backbg., 1939, Kakteenk.: 81. Type: *Echinocactus subgibbosus* Haw. Syn. *Bridgesia* Backbg., 1935 l, Blätt. f. Kakteenf., 1935-12. *Chileniopsis* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 283, 416. *Chilenia* Backbg., sensu Backeberg, 1938e, Blätt. f. Kakteenf., 1938-6 (earlier described without Latin diagnosis in Backeberg & Knuth, 1935, Kaktus-ABC: 299, and in Backeberg, 1936c, Blätt. f. Kakteenf., 1936-3.

This genus is now recognized as embracing the type selected by Britton and Rose and related species having flowers with connivent, always pinkish inner perianth-segments, a stalky tube with only a little felt in the axils of the scales, and a nearly naked fruit.

Bridgesia was erected to distinguish plants in which two or even three flowers were observed arising from a single areole. As this name was soon found to be preoccupied, it was changed to *Chileniopsis.* Later, when the geminous character of the flowers was observed in other Chilean genera and in *Weingartia, Chileniopsis* was reduced to synonymy.

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[1]Edited by E. Yale Dawson.

N. aspillagai (Soehr.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 259.

N. atrispinosa (Backbg.) Backbg., 1939, Kakteenk.: 81. Syn. *Chilenia atrispinosa* Backbg., 1938c, Blätt. f. Kakteenf., 1938-3.

N. castaneoides (Cels) Werd. Syn. *Chilenia castaneoides* (Cels) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 300.

N. cephalophora (Backbg.) Backbg., 1939, Kakteenk.: 81. Syn. *Chilenia cephalophora* Backbg., 1938c, Blätt. f. Kakteenf., 1938-3. *Neoporteria pygmaea* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20.

N. heteracantha (Backbg.) comb. nov. Syn. *Chilenia heteracantha* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 300, 417. This is a polymorphic species of which several variants were tentatively recognized by names which follow.

N. heteracantha var. *bicolor* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20.

N. heteracantha var. *depressa* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20.

N. heteracantha var. *macrogona* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20.

N. heteracantha var. *varians* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20.

N. mamillarioides (Hook.) Backbg., 1939, Kakteenk.: 81. See also Backeberg, 1950b, Acta Hort. Gotoburg.: 145. Syn. *Pyrrhocactus mammillarioides* (Hook.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 263. The orthographically incorrect original spelling "mammillarioides" is corrected according to the "Rules," Sec. 13, Art. 70. This is a much confused species. It has been mistaken by some authors for *Echinocactus centeterius* Lehm., a plant which Berger, 1929: 216, placed in *Pyrrhocactus,* saying, "flowers yellow." Schumann, 1898: 478, did the same, but Ruempler, 1886: 570, said "red flowers." If it is true that the original plant had yellowish-red flowers (see Britton & Rose, 1922: 203, who placed this species in *Malacocarpus* citing the name *Echinocactus centeterius* Lehm. as a synonym) this name cannot be valid, for all other strongly tuberculate species from Chile with yellowish-red flowers have older names. As Hooker had not seen the living plant and gave only a brief description, *E. centeterius* may be quite a different species. Doelz, shortly before his death told me that this was his opinion, because Schumann's illustration shows curved spines. The strongly tuberculate *Neoporteria* which I collected in Chile, and which Skottsberg collected at Frai Jorge, is unlike any species listed by Britton & Rose and may be Hooker's plant which also came from Chile. My plants, with yellow to reddish spines, represent the stoutest *Neoporteria,* and in flowering for me have exhibited the stoutest, longest *Neoporteria* flowers.

N. nidus var. *densispina* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20.

N. nidus var. *flava* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20. *Chilenia thiebautiana* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20, belongs near here as a form of *N. nidus* with rather stiff, pure black spines.

N. nigrihorrida (Backbg.) Backbg., 1939: 81. Syn. *Chilenia nigrihorrida* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 300, 417.

N. nigrihorrida var. *major* (Backbg.) comb. nov. Syn. *Chilenia nigrihorrida* var. *major* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 301, 417.

N. nigrihorrida var. *minor* (Backbg.) comb. nov. Syn. *Chilenia nigrihorrida* var. *minor* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 301, 417.

N. polyrhaphis (Pfeiff.) comb. nov. Syn. *Bridgesia polyrhaphis* (Pfeiff.) Backbg., 1939-l, Blätt. f. Kakteenf., 1935-12. *Chileniopsis polyrhaphis* (Pfeiff.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 284.

N. senilis (Phil.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 262. This species was erroneously regarded by Britton and Rose to be synonymous with *N. nidus. N. senilis,* however, has flowers nearly twice as long as *N. nidus,* and the spines are always softer.

N. subcylindrica (Backbg.) comb. nov. Syn. *Chilenia subcylindrica* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 301, 417.

N. subgibbosa (Haw.) Br. & R. Syn. *Chilenia subgibbosa* (Haw.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 301. *Chilenia acutissima* (Otto & Dietr.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 300.

N. villosa (Monv.) Backbg., 1939, Kakteenk.: 81. Syn. *Bridgesia villosa* (Monv.) Backbg., 1939 l, Blätt. f. Kakteenf., 1935-12. *Chileniopsis villosa* (Monv.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 284.

109. *Eriosyce* Phil. subgenus 1. *Philippia* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 273, without Latin diagnosis. The need for this category was eliminated when subgenus 2. *Soehrensia* was raised to genus status.

E. aurata (Pfeiff.) Backbg., 1937a, Blätt. f. Kakteenf., 1937-1. I have recollected this plant northeast of Santiago de Chile; it has golden yellow, not black spines.

110. *Islaya* Backbg., 1934j, Blätt. f. Kakteenf., 1934-10. Type: *Islaya minor* Backbg. The one species of this genus known to Britton and Rose was placed in *Malacocarpus*. The genus is characterized by the following: Flower small; pistil yellow; fruit hairy, thin-skinned, bristly and hollow, opening by a basal pore, the seeds in a little cuticular receptacle; plants with more or less felty apex. These rare plants which grow in the dry south Peruvian coastal desert near the sea form a quite isolated, characteristic group. Germination of greenhouse-grown seeds has never been observed to my knowledge.

I. islayensis (Foerst.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 258.

I. minor Backbg., 1934j, Blätt. f. Kakteenf., 1934-10.

I. molendensis (Vpl.) comb. nov. I feel that this should probably be recognized as a species distinct from *Echinocactus islayensis* Foerst.

111. *Copiapoa echinoidea* var. *salm-dyckiana* (Pfeiff.) Backbg., 1937h, Blätt. f. Kakteenf., 1937-8.

C. fiedleriana (K. Sch.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 280.

C. fiedleriana var. *polygona* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20. A variant with more ribs than the type of the species.

C. gigantea Backbg., 1936m, Jahrb. DKG: 104. Type locality: In the coastal range above Paposo (north of Taltal, Chile) on the Antofagasta-Paposo road.

C. haseltoniana nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 20. This is apparently a variant of *C. cinerea* with brown felt and longer yellow spines.

C. malletiana (Lem.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 280. This plant is a relative of *C. cinerea* (Phil.) Br. & R. with more tubercled ribs and mostly four black spines. It is early proliferous.

C. taltalensis (Werd.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 281.

SEMITRIBUS 2. Boreocereeae

SUBTRIBUS 1. Boreocereinae

NATIO 3. Echinocerei

114. *Peniocereus diguetii* (Weber) comb. nov. Syn. *Neoevansia diguetii* (Weber) Marshall, in Marshall & Bock, 1941: 84-86. Inasmuch as dahlia-like roots have recently been observed also in *Peniocereus macdougallii* Alex., and since the flower characters do not seem to separate the genera satisfactorily, I feel that *Neoevansia* should not be recognized as distinct.

119. *Wilcoxia schmollii* (Weingt.) Backbg., 1935k, Blätt. f. Kakteenf., 1935-11.

W. schollii var. *nigriseta* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 12.

W. schmollii var. *serpens* nomen nudum, in Backeberg, 1937m, 10 Jahre Kakteenf. (catalog): 12.

120. *Echinocereus floresii* Backbg., 1949a, Blätt. f. Sukkulentenk., 1.

NATIO 4. Nyctocerei

121. *Nyctocereus chontalensis* Alex. Syn. *Nyctocereus oligogonus* nomen nudum attributed to Backeberg in an editorial note, 1950, Cact. & Succ. Journ. Am.: 193.

122. *Eriocereus* (Berg.) Ricc. Subgenus 1. *Pseudoharrisia* nomen nudum, in Backeberg & Knuth, 1935, Kaktus-ABC: 178. This was a category not needed when Subgenus 2. *Roseocereus* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 179, was raised to genus status.

E. perviridis (Weingt.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 178.

E. regelii (Weingt.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 178.

124. *Arthrocereus* Berg. Subgenus 1. *Euarthrocereus* Backbg., 1950f, Cact. & Succ. Journ. Am.: 153. Type: *Cereus microsphaericus* K. Sch. This group is characterized by long, slender flower tubes with little wool.

A. campos-portoi (Werd.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 211.

Subgenus 2. *Cutakia* Backbg., 1950f, Cact. & Succ. Journ. Am.: 153. Type: *Arthrocereus mello-barretoi* Backeberg & Voll. This group is characterized by shorter, stouter flower tubes with longer and coarser wool.

A. mello-barretoi Backbg. & Voll, in Backeberg 1949h, Arqu. Jard. Bot. Rio de Janeiro: 157-8.

A. rondonianus Backbg. & Voll, in Backeberg 1935d, Blätt f. Kakteenf., 1935-4, without Latin diagnosis. As validating diagnosis: Humilis, basi ramosus, ca. 2 cm. crassus, ad 60 cm. altus, costis ca. 12, aculeis tenuissimis, ad 11 mm. longis, melleis; flore infundibuliformi, 6 cm. longo, phyllis perigonii interioribus purpurascentibus; tubo crassiore, pilis saetaceis.

NATIO 6. Pachycerei

SUBNATIO 1. Heliopachycerei

129. *Stenocereus* Riccobono, 1909: 253. Syn. *Neolemaireocereus* Backbg., 1942a, Cact. Jahrb. DKG.: 46, 76. This group, which I separated from *Lemaireocereus* Br. & R. because of its diurnal, narrowly campanulate flowers with bristles on the ovary and (always?) on the tube, has the same type as Riccobono's genus, namely, *Cereus stellatus* Pfeiffer. *Cereus chende* Goss. (*Lemaireocereus chende* (Goss.) Br. & R.) probably belongs here.

S. treleasii (Vpl.) comb. nov. Bravo (1937) says "The diurnal flowers and fruits resemble those of *Lemaireocereus stellatus.*"

130. *Isolatocereus* (Backbg.) Backbg., 1942a, Cact. Jahrb. DKG.: 47, 76. Type: *Cereus dumortieri* Scheidw. Syn. *Lemaireocereus* subg. *Isolatocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. This genus is characterized by diurnal flowers with only occasional bristles at the scales, and by fruits without spines and only occasional bristles.

I. dumortieri (Scheidw.) Backbg., 1942a, Cact. Jahrb. DKG.: 47.

131. *Anisocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. Type: *Cereus lepidanthus* Eichlam. This genus is characterized by tubular flowers whose tubes and ovaries have parchment-like scales, and by dry fruits with felt and bristles. Perhaps *Pachycereus? gaumeri* Br. & R. also belongs here.

A. lepidanthus (Eichlam) Backbg., 1938e, Blätt. f. Kakteenf., 1938-6, by mention as type of genus but without actual combination. Backeberg, 1942a, Cact. Jahrb. DKG.: 47.

132. *Pachycereus grandis* var. *gigas* Backbg., 1941a, Beitr. Sukkulentenk.-pflege: 2.

133. *Hertrichocereus* Backbg., 1950f, Cact. & Succ. Journ. Am.: 153. Type: *Cereus beneckei* Ehrenb. This genus is distinguished by its nearly creeping habit, its diurnal flowers (see Schlange, 1933: 435) and naked tubes. The ovary is tubercled, has felty areoles and sometimes a little spine. The fruit is spiny.

H. beneckei (Ehrenb.) Backbg., 1950f, Cact. & Succ. Journ. Am.: 153, as type of genus but without actual combination.

134. *Polaskia* Backbg., 1949a, Blätt. f. Sukkulentenk.: 4 (generic-specific description). Type: *Cereus chichipe* Gosselin, but the generic characteristics are actually based on a flowering specimen (Dawson 3025) from near Tamazulapan, Oaxaca, Mexico, regarded as that species. The genus is characterized by rather small, diurnal flowers from near the branch-apices, with strongly reflexed perianth-

segments, exserted stamens and scaly ovary, and by small, round fruits with short, bristly spines.

P. chichipe (Goss.) Backbg., 1949a, Blätt. f. Sukkulentenk.: 4.

SUBNATIO 2. Nyctopachycerei

136. *Carnegiea* Br. & R. Subgenus 1. *Eucarnegiea* Backbg., 1950f, Cact. & Succ. Journ. Am.: 154. Type: *Cereus giganteus* Engelm. This subgenus has apical, semidiurnal flowers with no bristles in the axils of the scales, the fruit splitting down from the top in 2-3 sections.

Subgenus 2. *Rooksbya* Backbg., 1950f, Cact. & Succ. Journ. Am.: 154. Type: *Cereus euphorbioides* Haw. This subgenus has lateral, nocturnal flowers sometimes with 1-2 short bristles in the axils of the scales, the fruit bursting open radiately at the top.

C. euphorbioides (Haw.) Backbg., 1944, Cact. Jahrb. DKG.: 13.

137. *Marshallocereus* Backbg., 1950f, Cact. & Succ. Journ. Am.: 154. Type: *Cereus aragonii* Weber. This is a genus of nocturnal flowers with spiny ovary, the tube with wool only. See Schlange, 1933: 434, for a photograph of a flowering plant of the type species.

M. aragonii (Web.) Backbg., 1950f, Cact. & Succ. Journ. Am.: 154, by mention as type of genus but without actual combination. Syn. *Neolemaireocereus aragonii* (Web.) Backbg., 1944, Cact. Jahrb. DKG: 16.

M. thurberi (Engelm.) comb. nov. Syn. *Neolemaireocereus thurberi* (Engelm.) Backbg., 1944, Cact. Jahrb. DKG.: 10. The classification here is based on Peebles' herbarium material (Peebles 1942: 4) showing a stiff bristly ovary and in which the note appears: "nocturnal, from shortly after sunset, closing the next morning."

138. *Ritterocereus* Backbg., 1942a, Cact. Jahrb. DKG.: 47, 76. Type: *Lemaireocereus standleyi* Gonzales-Ortega. This genus is characterized by nocturnal, slender-funnelform flowers with tube and ovary provided with few hairs and only the fruit spiny.

R. hystrix (Haw.) Backbg., 1944, Cat. Jahrb. DKG.: 17.

R. griseus (Haw.) comb. nov. Syn. *Neolemaireocereus griseus* (Haw.) Backbg., 1944, Cact. Jahrb. DKG.: 17.

R. pruinosus (Otto) comb. nov.

R. eichlamii (Br. & R.) comb. nov.

R. deficiens (Otto & Dietr.) comb. nov.

R. weberi (Coult.) comb. nov.

R. queretaroensis (Web.) comb. nov.

R. montanus (Br. & R.) comb. nov.

R. humilis (Br. & R.) comb. nov.

R. standley (Gonzales-Ortega) Backbg., 1942a, Cact. Jahrb. DKG.: 48.

139. *Lemaireocereus* Br. & R., emend Backbg., 1942a, Cact. Jahrb. DKG.: 48, 77. Type: *Cereus hollianus* Web. My emendation restricts this genus to the type species according to the following characteristics: flowering at the apex, nocturnal; flowers campanulate, with dense wool and bristles; fruits covered with clusters of bristles and spines. *Lemaireocereus* subgenus *Eulemaireocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6, earlier recognized along with subgenus *Marginatocereus* Backbg., was eliminated when the latter was raised to genus status.

140. *Mitrocereus* (Backbg.) Backbg., 1942a, Cact. Jahrb. DKG.: 48, 77. Type: *Pilocereus chrysomallus* Lem. = *Cereus columna-trajani* Karw. Syn. *Cephalocereus* subgenus *Mitrocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. These are gigantic plants with a felty apical area, the flowers apical, nocturnal, campanulate, densely woolly and bristly, the fruit bursting open at its top (See Hertrich, 1934a: 49-50). They differ from true *Pachycereus* in that the latter has no felty flower-zone at the apex, the flowers are not apical, and the fruits are dry and long-bristly.

M. columna-trajani (Karw.) Backbg., in Dawson, 1948: 4. Syn. *Mitrocereus chrysomallus* (Lem.) Backbg., 1942a, Cact. Jahrb. DKG.: 48, 77. See Dawson, 1948 for additional synonymy.

141. *Neodawsonia* Backbg., 1949a, Blätt. f. Sukkulentenk.: 4 (generic-specific description). Type: *Cephalocereus apicicephalium* Dawson. This genus is distinguished by its woolly apical cephalium which is grown through successively each year, the wool of the old cephalium being deciduous. Its small flowers from this apical wool have scales and a little wool.

N. apicicephalium (Dawson) Backbg., 1949a, Blätt. f. Sukkulentenk.: 4.

142. *Cephalocereus* Pfeiff., emend. Backbg., 1942a, Cact. Jahrb. DKG.: 48, 77. Type: *Cactus senilis* Haw. An earlier, less restrictive emendation was made (Backeberg, 1938e, Blätt. f. Kakteenf., 1938-6) at which time subgenus *Eucephalocereus* Backbg. and subgenus *Mitrocereus* Backbg. were erected. The former was eliminated with the raising of the latter to genus status and with the more restrictive emendation of *Cephalocereus*. From the genus *Cephalocereus* as recognized by Britton and Rose, 1920, a miscellany of many quite widely differing plants, I have separated out the following genera: *Austrocephalocereus, Brasilicereus, Coleocephalocereus, Neobuxbaumia, Pilocereus* and *Subpilocereus*. Since their genus was such a mixture, it is difficult to understand why Britton and Rose did not include other plants as well, such as those in their genus *Espostoa*.

143. *Haseltonia* Backbg., 1949a, Blätt. f. Sukkulentenk.: 3 (generic-specific description). Type: *Pilocereus hoppenstedtii* Weber. This is one of the best characterized of the Mexican cerei: Stems normally simple (!) becoming attenuated and curved in upper parts in age; flowers short-campanulate, nearly tubeless, naked, originating from a lateral cephalium, not circumfluent as in mature *Cephalocereus*.

H. hoppenstedtii (Web.) Backbg., 1949a, Blätt. f. Sukkulentenk.: 3.

144. *Neobuxbaumia* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. Type: *Pilocereus tetetzo* Weber. This genus is characterized by apical flowering, the flowers not widely opening, of a peculiar campanulate-cylindrical form, naked and with rather scaly tubes. See Poindexter, 1949: 117-118 for good illustrations of the flowers.

N. mezcalaensis (Bravo) Backbg., 1941a, Beitr. Sukkulentenk.-pflege: 3.
N. mezcalaensis var. *robustus* (Dawson) comb. nov.
N. polylopha (DC.) Backbg., 1938e, Blätt. f. Kakteenf., 1938-6.
N. scoparia (Poselg.) Backbg., 1941a, Beitr. Sukkulentenk.-pflege: 3.
N. tetetzo (Web.) Backbg., 1938e, Blätt. f. Kakteenf., 1938-6.

NATIO 7. Polyanthocerei

SUBNATIO 1. Heliopolyanthocerei

145. *Marginatocereus* (Backbg.) Backbg., 1942a, Cact. Jahrb. DKG.: 49, 77. Type: *Cereus marginatus* DC. Syn. *Lemaireocereus* subgenus *Marginatocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. This genus is characterized by small, narrow, tubular flowers, closely set and often geminate, with more or less scurfy tube bearing bunches of wool and small spines. The perianth-segments are short.

M. marginatus (DC.) Backbg., 1942a, Cact. Jahrb. DKG.: 49, 77.

NATIO 8. Gymnocerei

148. *Brasilicereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6., and more formally in Backeberg, 1942a, Cact. Jahrb. DKG.: 50, 77. Type: *Cereus phaeacanthus* Gürke. This genus is characterized by scaly, slightly bent flowers with small ovary arising from areoles bearing no hairs.

B. markgrafii Backbg. & Voll, in Backeberg, 1949h, Arqu. Jard. Bot. Rio de Janeiro: 154-55.

B. phaeacanthus (Gürke) Backbg., 1942a, Cact. Jahrb. DKG.: 50, 77. Syn. *Pilocereus phaeacanthus* (Gürke) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 33.

149. *Monvillea* Br. & R.

Subgenus 1. *Eumonvillea* Backbg., 1948d, Jahrb. Schw. KG.: 52-53. Type: *Cereus cavendishii* Monv. This group is characterized by slender flower tubes, round ovaries, and globular, juicy fruits.

Subgenus 2. *Ebneria* Backbg., 1948d, Jahrb. Schw. KG.: 52-53. Type: *Cereus spegazzinii* Weber. This group is distinguished by its slender flower-tubes, cylindrical ovaries, and clavate, nearly dry fruits.

M. haageana Backbg., 1948d, Jahrb. Schw. KG.: 52-53.

M. lindenzweigiana (Gürke) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 183. This plant may be only a variety of *Monvillea anistzii* (K. Sch.) Berg.

Subgenus 3. *Hummelia* Backbg., 1948d, Jahrb. Schw. KG.: 52-53. Type: *Monvillea maritima* Br. & R. This group is distinguished by its shorter, stouter flower tubes, oblong ovaries, and fleshy, more or less grooved fruits.

M. maritima var. *spinosior* Backbg., 1948d, Jahrb. Schw. KG.: 53-54.

M. smithiana (Br. & R.) Backbg., 1944, Cact. Jahrb. DKG.: 19. A flowering plant is shown in Backeberg, 1930a, Kakteenjagd: 27.

150. *Cereus* Mill.

Subgenus 1. *Eucereus* Backbg., 1950f, Cact. & Succ. Journ. Am.: 154. Type: *Cactus hexagonus* L. This subgenus is distinguished by its splitting fruits.

C. insularis Hemsley. This plant from the island of Fernando Noronha was placed in *Monvillea* by Britton and Rose, but is, according to photos sent me by Voll, a true *Cereus* with long-persisting style after the withered perianth has fallen off. It is near the group of bushy, rather low north Brazilian cerei including *C. variabilis, C. obtusus* and *C. pernambucensis.*

Subgenus 2. *Neocereus* Backbg., 1950f, Cact. & Succ. Journ. Am.: 154. Type: *Cereus huntingtonianus* Weingart. This subgenus is distinguished by shrinking, non-splitting fruits.

NATIO 9. Cephalocerei

SUBNATIO 1. Acephalocerei

151. *Subpilocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. Type: *Cereus russelianus* Otto. Syn. *Pilocereus* Subg. *Oblongicarpi* Croizat, 1950: 4. The plants of this group are almost hairless cerei from northern Venezuela, the adjacent islands and the coast of Colombia. The flowers have slender, funnelform tubes narrowed in the middle. The fruits are thick-skinned and longish with dull, rather large seeds.

S. atroviridis (Backbg.) comb. nov. Syn. *Cereus atroviridis* Backbg., 1930, Monats. DKG.: 164. *Pilocereus atroviridis* (Backbg.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 327.

S. horrispinus (Backbg.) comb. nov. Syn. *Cereus horrispinus* Backbg., 1930, Monats. DKG.: 164. *Pilocereus horrispinus* (Backbg.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 327.

S. ottonis Backbg., 1944, Cact. Jahrb. DKG.: 88. This is a Colombian plant illustrated by Britton & Rose, 1920, fig. 39, but incorrectly referred to the Venezuelan *Cephalocereus russelianus. S. ottonis* is a species with few ribs and with a light epidermal bloom on young parts which later become olive-gray.

S. remolinensis (Backbg.) comb. nov. Syn. *Cereus remolinensis* Backbg., 1930, Monats. DKG.: 162. *Pilocereus remolinensis* (Backbg.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 327. Backeberg, 1936j, Blätt. f. Kakteenf., 1936-10.

S. repandus (L.) comb. nov. Syn. *Cereus albispinus* S.-D. *Pilocereus albispinus* var. *weberi* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 326, without Latin diagnosis.

S. russelianus (Otto) Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. Syn. *Cereus fricii* Backbg., 1930, Monats. DKG.: 166. *Pilocereus fricii* Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 326. *Cereus bergeri* nomen nudum in Backeberg, 1930b, Deutsche Gartenz: 81-82. This is Otto's dark green Venezuelan plant from La Guayra which lacks an epidermal bloom.

S. russelianus var. *margaritensis* (Johnst.) comb. nov. Syn. *Pilocereus russelianus* subsp. *margaritensis* (Johnst.) Croizat, 1950.

S. wagenaari (Croizat) comb. nov. Syn. *Pilocereus wagenaari* Croizat, 1950: 3. Although I do not venture to reduce this plant to synonymy, I am unable to tell from Croizat's account how it differs from *Pilocereus russelianus.*

152. *Pilocereus* Lem. I now recognize this genus as having the following characteristics:

Plants with a more or less hairy flowering zone, the hairs in some species more or less reduced or even wanting; without a true cephalium or pseudocephalium (dense wool zone); flowers, with one exception, naked; fruits depressed!; seeds shiny.

Subgenus 1. *Mediopilocereus* Backbg., 1942a, Cact. Jahrb. DKG.: 51, 77. Type: *Cereus minensis* Werd. This group is distinguished by hairless areoles and flowers with scales (in one case with felt rests).

P. campinensis Backbg. & Voll, in Backeberg, 1949h, Arqu. Jard. Bot. Rio de Janeiro: 161-164. This plant has a scaly tube and ovary, but the fruit is unknown. If it proves not to be depressed, this species probably will be transferred to *Monvillea,* although it does not have the true *Monvillea* flower.

P. minensis (Werd.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 328. This plant has a little hair-rest in the axils of the scales. Its seeds are brown.

Subgenus 2. *Eupilocereus* Backbg., 1942a, Cact. Jahrb. DKG.: 51, 77. Type: *Pilocereus leucocephalus* Poselg.

P. backebergii (Wgt.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 329; Backeberg, 1936j, Blätt. f. Kakteenf., 1936-10.

P. bradei Backbg. & Voll, in Backeberg, 1935a, Blätt. f. Kakteenf., 1935-1, without Latin diagnosis. Diagnosis in Backeberg, 1942a, Cact. Jahrb. DKG.: 78.

P. claroviridis (Backbg.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 330. Syn. *Cereus claroviridis* Backbg., 1930b, Deutsche Gartenz: 81-82; 1931, Neue Kakteen: 69. I do not agree with Croizat, 1950: 4, who considers this plant equivalent to *Pilocereus moritzianus* (Otto) Lehm. but does not indicate his reasons.

P. colombianus (Rose) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 330. *Cereus multispinus* nomen nudum, in Backeberg, 1930b, Deutsche Gartenz: 81-82, perhaps belongs here.

P. cuyabensis Backbg., 1935a, Blätt. f. Kakteenf., 1935-1. First mentioned in Backeberg, 1933t, Der Kakteen-Fr.: 128. This is as yet the only known species from central Brazil. It has rather long, loose wool in the young areoles.

P. floccosus Backbg. & Voll, in Backeberg, 1949h, Arqu. Jard. Bot. Rio de Janeiro: 150-152.

P. gounellii var. *zehntneri* (Br. & R.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 331.

P. guerreronis Backbg., 1941a, Beitr. Sukkulentenk.-pflege: 3.

P. moritzianus (Otto) Lehm. Syn. *Cereus moritzianus* var. *robustus,* var. *curvispinus,* forma *monstrosa, Cereus weingartii, Cereus Klousacekii,* all nomina nuda in Backeberg, 1930b, Deutsche Gartenz: 81-82.

P. tweedyanus (Br. & R.) Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 334. This south Ecuadorean species I have found also in northern Peru in the eastern Despoblado, east of Serrán. It is the southernmost Pilocereus in western South America.

P. vollii Backbg., in Backeberg & Knuth, 1935, Kaktus-ABC: 334, 417. This plant may be a natural hybrid between *Pilocereus arrabidae* and *Coleocephalocereus fluminensis,* to judge from the flowers which show some resemblance to the latter. It was found by Voll on the slopes of Pan de Azucar, Rio de Janeiro, Brazil.

SUBNATIO 2. Hemicephalocerei

153. *Micranthocereus* Backbg., 1938e, Blätt. f. Kakteenf., 1938-6. Type: *Cephalocereus polyanthus* Werd. This genus is characterized by many very small flowers with very short perianth-segments and very short tubes, and by operculate small fruits.

M. polyanthus (Werd.) Backbg., 1938e, Blätt. f. Kakteenf., 1938-6.

SUBNATIO 3. Eucephalocerei

155. *Vatricania* Backbg., 1950f, Cact. & Succ. Journ. Am.: 154. Type: *Cephalocereus guentheri* Kupper. The following characters distinguish this genus: cephalium superficial, to 50 cm. long, on one side only, of brownish, silky wool; flowering areoles with up to 100 bristles and no spines; flower tubular-campanulate, 8 cm. long, opening only 2.5-3 cm., the tube densely covered with pinkish-brown, silky wool.

DESCRIPTION OF A SEDUM FROM ORIZABA, VERA CRUZ

By ROBERT T. CLAUSEN

The *Sedum* which is the subject of this discussion has reached me from four different sources. In 1944, Mrs. Ethel Rush sent it under her No. 19. She had received it from Mr. Eric Walther as an undescribed species with white flowers. Mr. Walther in turn had obtained it in 1935 on a steep rocky hillside at Orizaba in the state of Vera Cruz, Mexico. Also in 1944, I received this same species from Mr. J. R. Brown whose material likewise had come from Mr. Walther. In 1949, Mr. E. J. Alexander of the New York Botanical Garden gave me a cutting of the same *Sedum*. He had obtained his specimen at a nursery in Mexico City. Finally, Mr. C. L. Cass sent me specimens of this species both in 1948 and 1949. The original source of his plants is unknown. All plants from the several sources are the same. They appear to be related to *S. adolphii* and *S. nussbaumerianum*, but not a match for either species. In the following key, the distinguishing characteristics are indicated:

A. Cymes compound, dichasial; pedicels 2-4 mm. long; stamens 3-4 mm. long; leaves lustrous, dark green . . . . . *Sedum* from Orizaba

AA. Cymes compound, pleiochasial; pedicels 8.5-20 mm. long; stamens 5-7 mm. long; leaves lustrous or sublustrous , ... B.

B. Flowers at different levels in the cymes, not all in one plane; petals ovate-lanceolate, 3-3.5 mm. broad, white throughout; leaves strongly carinate dorsally, principal ones 8-10 mm. thick . . . . . *S. adolphii*

BB. Flowers appearing all in the same plane; petals linear-lanceolate, 1.5-3 mm. broad, pinkish dorsally; leaves convex, obscurely carinate dorsally, principal ones 5-8 mm. thick . . . . . *S. nussbaumerianum*

Walther published as fig. 26 on p. 71 of the Cactus and Succulent Journal, vol. 8, Nov., 1936, a photo of the new *Sedum* growing on rocks with a *Begonia*, near Orizaba. It was on a steep hillside to which he had been guided by Mr. Dorn. *Echeveria nuda* and *Epidendrum radicans* were on this same hillside. Walther did not describe and name the *Sedum* at the time when he published the photograph because he wanted first to study types in Europe. He did suggest, however, that it must be near to *S. adolphii*. Since 1944, I have tried in vain to match this particular *Sedum* with any previously named species. One idea, shared by Walther, was that it might be Hemsley's *S. tortuosum*. Study of a photograph of the type of *S. tortuosum* and careful perusal of the original description have convinced me that Hemsley's species is not the same as the *Sedum* from Orizaba. According to Hemsley, *S. tortuosum* has spurred sepals whereas the sepals of the species from Orizaba are not spurred. Also, the type of *S. tortuosum* has leaves which are smaller, narrower and more definitely spatulate. My opinion now is that *S. tortuosum* may be a synonym of *S. amecamecanum* Praeger, but enough doubt exists that Praeger's clearly typified name should not be displaced by the earlier one of Hemsley. Other old names proposed in *Sedum* do not seem to apply to the white-flowered species from Orizaba. For that reason, I am proceeding to describe this as a new species, indicating in the specific epithet one of its distinctive features, namely the lustrous leaves.

Sedum lucidum, sp. nov., subgeneris *Pachysedum*, sectionis *Pachysedum* (*Eupachysedum*). Suffrutices glabri, caulibus decumbentibus, 5-7 mm. in diam., ad 35 cm., surculis sterilibus erectis ad basim; folia spiraliter alterna, divaricata, oblongo-elliptica vel spatulato-oblonga, sessilia, breve calcarata, acuta ad apices, aliquanto angulata et carinata, plus vel minus plana ventraliter et convexa inaequaliter carinata dorsaliter, minimum sursum curva, viridia et lustra, 0.7-4.8 cm. longa, 6-19 mm. lata, 3.6-10 mm. crassa; caules floriferi axillares, divaricati, in axillis foliorum superorum, 6-15 cm. longi, foliis remotis, ovato-ellipticis, breve calcaratis, acutis vel obtusis, chloris et lucidis, 3.4-12 mm. longis, 2-5 mm. latis; cymae compositae, dichasia, 3.5-6 cm. in diam.; flores plerumque 5-partiti, rariter 4-partiti, 9-11 mm. in diam., moschato-odorati, in pediculis puniceis, 2-4 mm. longis; sepala inaequalia, oblonga vel lanceolata, obtusa, erecta, lucida, viridia, 2-4 mm. longa, connata ad basim 1 mm.; petala elliptico-lanceolata, acuta, mucronato-appendiculata, late divaricata super bases suberectas, 5-6 mm. longa, 2-2.2 mm. lata, connata infra 0.6 mm., alba; stamina 2.4-4.4 mm. longa filamentis albis et antheris luteis, epipetala adnata 1.2-1.5 mm. super bases; squamae transverse oblongae, erosae, emarginatae, 0.3-0.7 mm. longae, 0.6-0.7 mm. latae, galbanae vel albae; pistilla erecta, stylis subdivaricatis, 4-4.6 mm. longa, pallide chlora. Floret ab Novembre ad Martium. Typus est planta culta in Ithaca, N. Y., 1951, Jan. 3, C 44-12, originaliter ab Orizaba, Mexico, ubi Eric Walther eandem collegit.

Sedum lucidum belongs to the subgenus

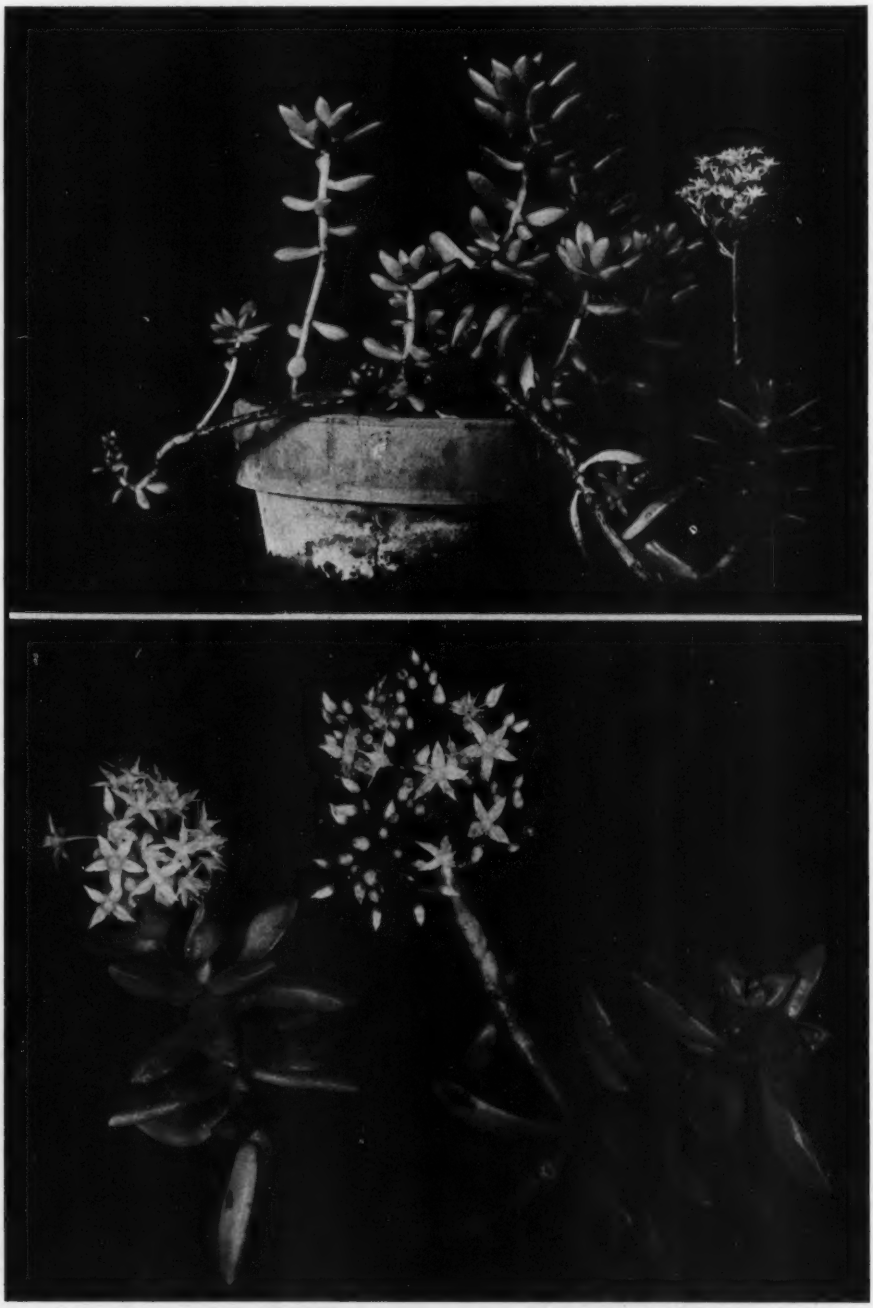

FIG. 77. (Above) *Sedum lucidum* cultivated in the greenhouse at Ithaca, N. Y. This was grown from a cutting from the original collection from Orizaba. Photo by H. Lyon. (Below) *Sedum nussbaumerianum* (left) and *S. adolphii* (right), the latter from Mrs. Ethel Rush, Los Angeles, California, and the other a specimen cultivated at Ithaca, New York. Photo by W. R. Fisher.

Pachysedum and section *Pachysedum* (*Eupachysedum*). The plants are glabrous subshrubs with decumbent stems, reddish brown below, green upwards, 5-7 mm. in diameter, to 35 cm. long, towards base giving rise to erect sterile shoots; leaves alternate, widely spreading, oblong-elliptical or spatulate-oblong, sessile, short-spurred, acute at apex, somewhat angulate and keeled, more or less plane ventrally and convex and unevenly keeled dorsally, slightly upcurved, 0.7-4.8 cm. long, 6-19 mm. wide, 3.6-10 mm. thick, dark green and lustrous, especially when young; floral stems axillary, 6-15 cm. long, divergent, in the axils of the upper leaves; floral stems with the leaves remote, ovate-elliptic short-spurred, acute or obtuse, light green and very lustrous, 3.4-12 mm. long, 2-5 mm. wide; cymes compound, dichasia, 3.5-6 cm. long, 4-6 cm. wide; flowers mostly 5-merous, rarely 4-merous, 9-11 mm. in diam., with musky fragrance, on flesh-colored pedicels, 2-4 mm. long; sepals very unequal, oblong to lanceolate, blunt, erect, lustrous, green, 2-4 mm. long, connate at base for 1 mm.; petals elliptic-lanceolate, acute, mucronate-appendaged, widely spreading above the suberect bases, 5-6 mm. long, 2-2.2 mm. wide, connate at base for 0.6 mm., white; stamens 2.4-4.4 mm. long with white filaments and yellow anthers, the epipetalous on the petals 1.2-1.5 mm. above their bases; nectaries transversely oblong, erose, emarginate, 0.3-0.7 mm. long, 0.6-0.7 mm. wide, pale greenish yellow or white; pistils erect with styles subdivergent, 4-4.6 mm. long, greenish white or very pale yellow. Flowers from November to March. The type is a specimen cultivated in the greenhouse at Ithaca, N. Y., C 44-12, Jan. 3, 1951. It came originally from near Orizaba, Mexico, where Eric Walther collected it in 1935.

S. lucidum is the eighth species of *Sedum* which I have recorded from Vera Cruz. The others are *S. dendroideum, S. purpusii, S. botteri, S. nussbaumerianum, S. obcordatum, S. hemsleyanum,* and *S. moranense. S. aoikon* possibly is native near Orizaba, but its occurrence there should be verified before it is included definitely in the list for Vera Cruz. *S. dendroideum, S. purpusii, S. botteri* and *S. obcordatum* all have yellow petals. *S. hemsleyanum* is an herb. *S. moranense* has closely crowded, small ovate leaves and kyphocarpic pistils. *S. nussbaumerianum,* with flowers on long pedicels, is most closely related to *S. lucidum.* Likewise, *S. adolphii* is related. That still has not been found at any definite locality in Mexico. When something is known concerning the variation of *S. adolphii* in the wild, the status of *S. nussbaumerianum* will need to be reappraised: Uhl[1], who has studied some of my plants cytologically, has reported gametic numbers of 64 for one plant of *S. adolphii* and three plants of *S. nussbaumerianum.* For *S. lucidum,* listed as "near *tortuosum* Hemsley," "Clausen's species No. 503," he reported a gametic number of 34 chromosomes for a plant of the type collection. These data suggest that the origin of *S. adolphii* and *S. nussbaumerianum* from their nearest relatives must have involved both an adjustment in the basic number of chromosomes and the attainment of a higher level of polyploidy. On a basis of morphological evidence, *S. lucidum* impresses me as the most primitive and *S. nussbaumerianum* as the most advanced of this group of three species.

The only noteworthy variation of *S. lucidum* that has come to my attention is a cristate condition which has developed spontaneously in two of my plants.

In conclusion, I wish to thank all those who by supplying specimens or information have made possible the preparation of the above account. Particularly, I wish to express appreciation to Mrs. Ethel Rush, Mr. E. J. Alexander, Prof. A. L. Andrews, Mr. J. R. Brown, Mr. C. L. Cass, Dr. C. H. Uhl and Mr. Eric Walther.

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[1]Uhl, C. H. A cytotaxonomic study of the Crassulaceae. Manuscript thesis, Cornell University, p. 1-203, pl. I-VIII. 1947.

THE MARNIER GARDENS IN SOUTHERN FRANCE

By CURT BACKEBERG

Cap-Ferrat is, no doubt, the most beautiful cape of the European coasts. Like a bifurcated snake-tongue it projects into the mild blue waters of the Cote d'Azur and enjoys the fresh air of the Mediterranean Sea.

It was King Leopold I, of Belgium, who discovered that nice place, a jewel of France, and built there a refuge for escaping the cold and rainy northwestern winter-time. Later this place was bought by Mr. J. Marnier-Lapostolle, the owner of the world-wide known factories of the famous Liquor Grand Marnier. And it was he, who created the real paradise which is found now in this wonderful cape.

Maybe it was at first a hobby, but soon it became a grandiose project. With exception of this corner of the Old World, the European climate does not permit to plant tropical or semi-tropical plants in the open air. But the neighbouring eastern part of Cap-Ferrat is called "little Africa." And this says enough. So it was Albert II. of Monaco who founded the Jardin Exotique of Monaco, an attractive garden on the high cliffs above the little principality, and millions

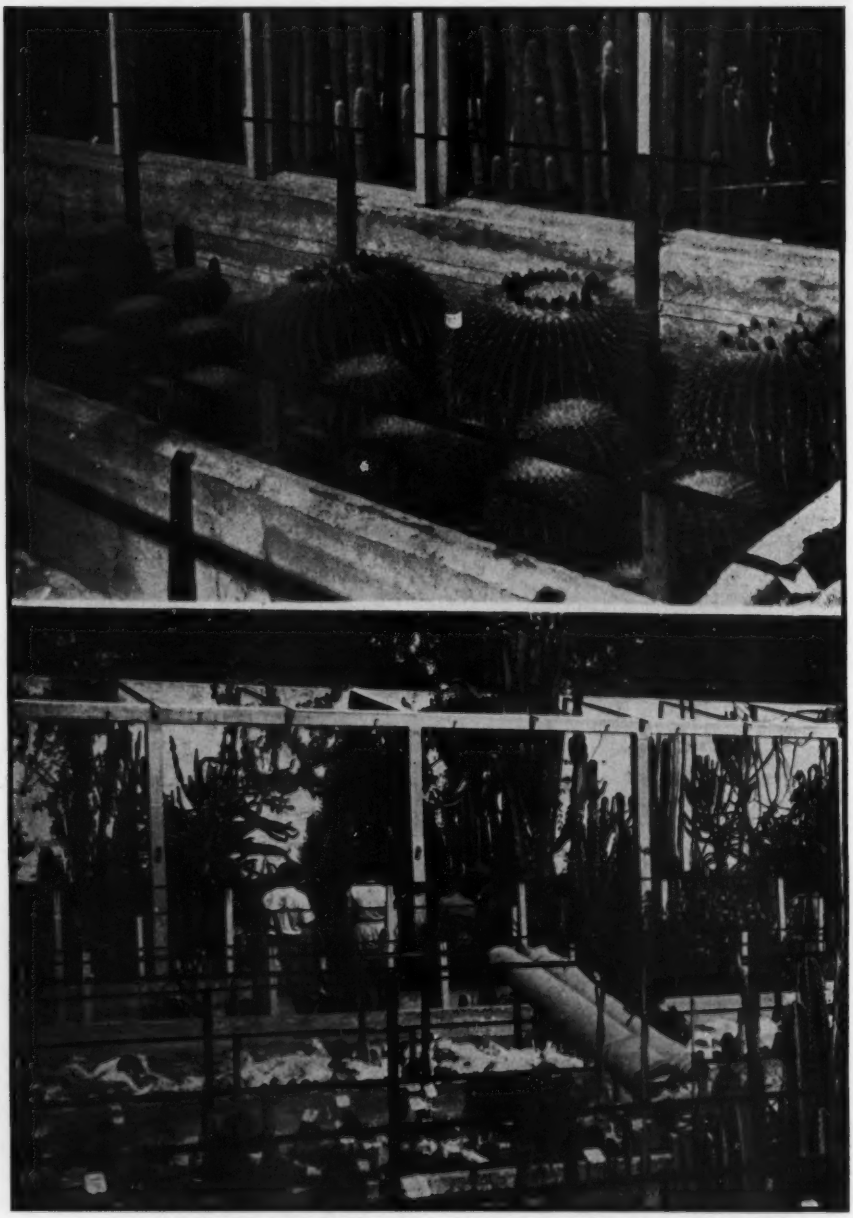


FIG. 79. Views of a small portion of the Marnier cactus section which is visited by thousands each year. This garden, between Nice and Monaco in St. Jean Cap-Terrat, France, is world famous.

FIG. 78. J. Marnier-Lapostolle in his famous garden.

have seen the decorative showing of great cacti and other succulents of that place, where my good friend Vatrican is the director.

The rather dry slopes and the burning sun do not permit the planting of other representatives of exotic flora than those which come from arid or semiarid areas.

Cap-Ferrat is well suited for a tropical garden. This was the starting-point of Mr. Marnier's project: to create here a Botanical Garden which permits the European botanists to study the interesting tropical and subtropical flora, and the European visitors to see the wonders of the Tropics and the colorful deserts in carefully collected and cultivated departments of the park.

Mr. Marnier is more than a rich owner of a great garden. As an excellent connoisseur of the tropical and subtropical flora, his aim was to create a paradise for all those who are interested in tropical beauty.

Of course the botanical importance of the garden is the most important view-point. Therefore all collections are continuously maintained, as much as possible, and the great variation of the impressive plantings gives this park its remarkable attraction.

You see there a beautiful lake with many kinds of water-plants, wonderful promenades, bordered by high palms, you are passing a bamboo-wood and are entering a real tropical forest with its mysterious darkness and the high filigree of tree-ferns, the fragrance of all kinds of citrus-flowers are perfuming the air, you are crossing a kind of Mexican bush-forest where many-colored Aras are practising gymnastics in the tops, and a large planting of Opuntias is showing you that there is still another department in this garden which you have not yet seen. Beautiful little gardens, resembling a world of fables, separated by carefully cut hedges, conduct you to a large, white porch. Here is the sanctuary of the park: the cactus-garden. Its importance is not to be a decorative collection—nevertheless, it is. It shows the rarest plants and those of special botanical interest in large specimens.

This cactus-garden is but one-half of the collection. At the end of the park you see the greenhouse-department and many frames. Here are the collections of the smaller plants, and in the greenhouses Bromeliads and more delicate tropical plants.

In this article I can give only a general view of this garden, the living monument for a great herbalist and friend of the plant-world, of whom the succulent collectors will hear still more. Nice and important collections of other succulents are also found in this garden: Euphorbias, Mesembrianthemaceae and so on.

My American friends will realize how much I am indebted to Mr. Marnier that he enabled me to go with my most important plants to this beautiful place and that he appointed me as director of his garden. The reader will understand that this means for me a new and important chapter of my life's work, and certainly I can give interesting reports from Cap-Ferrat, the charming place of pilgrimage for European succulent-botanists and amateurs, who are wishing to forget for a while the Old World and to see the wonders of far away lands and its beautiful flora.

Order the new Aloe book now and check your plants. Dr. Reynold's 650 page monograph with 572 illustrations and 75 color plates is now available. Order your copy now. $14.50 postpaid in U. S. A. plus tax on California sales. Exclusive distributor in North America: Abbey Garden Press, 132 W. Union, Pasadena 1, California.

FIG. 80. Grafted *Aporocactus flagelliformis* grows into a mound four feet high.

FROM HERE AND THERE

Edited by SHERMAN E. BEAHM, 2686 Paloma, Pasadena, California

From Alexandre, New Zealand

"Just before dollar remittances were stopped prior to the late war, I had bought a bound copy of *Cacti for the Amateur*. At that time I had a few bits and pieces of cacti, and being unable to try my hand at grafting with the recommended stocks and scions (that is to say, I could not pay attention to compatibility) I went ahead and practiced with the scraps I had. I had a small *Opuntia tomentosa* growing outside my former home in Auckland. It had not more than a dozen pads on it and I made a stab-graft on the older part where the stem was thick, using as a scion a rather weary looking scrap of *Aporocactus flagelliformis*. This knitted well, but before it could make any growth, my family and I moved to Tauranga bringing my outdoor plants along in crates and after a time was able to plant them here. Tauranga has a light and porous soil well adapted for cacti and is second place in long hours of sunshine in New Zealand. In the past nine years I have seen my graft grow from a weary scrap to its huge mound shown in the pictures.

In the photo the plants visible are low down at left *Aloe distans*, then left to right *Opuntia scheeri*, *Opuntia tomentosa* with a graft of *Aporocactus flagelliformis; Cereus* with *Agave decipiens* behind at right and at lower right *Tricocereus spachianus*.

"Is there any explanation for the following results I have obtained?

"The Opuntia-Aporocactus combination has short, stout, many branched arms like the stock. Generally speaking the graft flowers indifferently as to quantity but this season it has flowered more frequently and profusely.

"My Selenicereus-Aporocactus graft has slender stems no thicker than a pencil and average three feet long. It is kept in a glasshouse and flowers well. In two ways it shows the characteristics of the stock. It is long and ropy and puts out aerial roots like the stock."

If the former is grown outside and the latter is a glasshouse plant, this might account for some of the difference. The Opuntia stock is also a huskier stock plant.

* * *

The Epiphyllum Society of America held its annual Cut Flower Exhibit (epis) on May 17th under the leadership of the chairman, vice-president R. E. Wright. The affair proved to be the most memorable one we have yet held. The visitors were kept entertained by Mrs. Margaret Carrick, the eminent author and teacher of flower arrangements. The arrangements she constructed for the public were left on display. Demonstrations of corsage making were handled by Mrs. Ellen Crozier assisted by Mrs. Wright during the entire evening, the corsages being distributed to visitors. After the judges, Mrs. Cactus Pete, Mr. Sherman E. Beahm and Mr. Cristian Leder, had selected the winners, the public was permitted to view the displays, both private growers and commercial. A fuller account of the affair is given in the current Epiphyllum Society Bulletin, subscription to which is included in membership to the Society.

* * *

In an old German book we found pencil marks beside one of the illustrations "covered with scale pests." Actually this photograph of *Bergeranthus multiceps* was covered with deposits of alkali from watering. This spotting of the foliage of succulent plants is always a great handicap for the photographer. The only way to grow a clean plant for photographing is to water at the base of the plant instead of spraying.

* * *

In my garden on July 10, I had 41 different hybrid Epiphyllums in flower. The flowering period of these hybrids can be extended.

THE DEALER'S CORNER

PROBLEMS OF RAISING CACTI IN THE DESERT

Contrary to general belief—the most difficult place in the world to raise cactus, is in the desert. We have been raising cactus for years here in Phoenix, Arizona—which is in the center of one of the hottest and *driest* regions in the United States. Late spring and summer temperatures generally are between 95 and 115 degrees— and there is very little if any rainfall in this period, which extends into October. Because of the extreme dryness, the soil gives up its moisture quickly, and in the case of well-drained sandy soils, used in cactus culture, there is the problem of giving enough water yet not overwatering. This we have solved by mixing granulated "Vermiculite" or peat moss in limited amounts with our soil mixture. These moisture retainers help keep the upper layer of the soil beds (which dry out so quickly) more humid. The only exception to this is in the culture of Astrophytums, etc., in which case we use a very sandy top soil to prevent damp rot.

The dry desert winter period is another difficult time. Even though we know that Cacti must have a good rest period, there must still be enough dampness in the soil to prevent roots from dry shrivelling. Generally, in most parts of the United States, cacti are watered every four to six weeks in winter. Yet here where our humidity is usually very low, we must water every three to four weeks in the winter, to keep roots in good condition. We do have freezing temperatures here in the winter; December and January bring night temperatures as low as 16 degrees, with frost. In the last few years, we have lost tens of thousands of seedlings during cold spells.

Our greatest enemy here in the desert (and this seems surprising enough) is the sun. During late fall, winter and early spring, there is no trouble from this source—but the six hot months (May to October) is our danger period. Most of our plants sunburn, in fact—cook, in the open desert sun. The old trick of placing a plant out early in the spring, and getting it accustomed to the sun gradually, just doesn't work out too well here.

The only plants that can take our full sun are the very few desert species, such as *Ferocactus acanthodes,* large Saguaro, certain Opuntia, Cholla and *Echinocereus Engelmanni.* Even these generally must be accustomed to it gradually. We have had to put open lath over all our plants, including large Echinocerei, Echinocacti, Cerei, Echinopsis, and others. Even young Saguaros burn, up to two feet in height; since in their natural habitat they generally grow up in a desert bush until they outgrow the shrub.

We have come to the conclusion that most cacti hate a direct *hot* sun, and in nature most cacti are growing in their best condition in the partial shade of trees, shrubs, rocks, weeds and grass. The cacti that grow in open, unshaded spots in the desert are those few species that are hardy enough to take it, and they grow there, not from choice, but by chance (or should we say, misfortune). Yet, this does not imply that cacti want shade—they still must have lots of light and plenty of filtered sun.

We might add here that in Arizona and New Mexico, most of our wild plants grow on hillsides that have plenty of oak and/or mesquite leafmold. We have found oak leafmold just about the best thing for cactus culture and to counteract the slight acid-soil condition which oak leaf might create, some lime is added to it. Generally most tap water is hard (limey), and adds enough lime to do the same. Our native Coryphanthas, Echinocerei, and Mammillariae, thrive on oak leaf—both in the native and domestic state. Gymnocalyciums do their best in sand and oak leaf mixture, adding just a bit of lime and some garden soil to the mix.

Raising cacti has its own problem in the various parts of the country, and the desert has its difficulties—just as well as other locales.

It is quite common for one of our customers to say to us, "Yes, it is easy to grow cactus in your desert soil!" But this is a fallacy—as the desert soil is the poorest soil in the world. We have to add leafmold, old steer manure, and nitrogen compounds to our poor desert soil to bring it up to where it has enough organic matter to grow a plant successfully.

ROCKING HORSE CACTUS GARDENS
WM. MASTRANGEL, *Mgr.*

BIRMINGHAM EXHIBITION

A high standard of exhibits was attained by Birmingham branch members of the National Cactus and Succulent Society at their show at the White Horse Hotel, Birmingham, England. A member of the Cactus and Succulent Society of America, Mrs. Alice M. Carr, won the large silver cup for the best Mammillaria in the show, also 6 firsts, 1 second, and 1 third prize. Her miniature garden, about the size of your hand, also won first prize.

The chairman of the branch, Mr. E. Russell, of Edgbaston, said the show indicated an increasing interest in the cultivation of these plants. He emphasised that they are not difficult to grow and said people interested could gain valuable information at the society's lectures at Birmingham University, Edmund Street.

QUESTIONS and ANSWERS

Conducted by
HARRY JOHNSON
Paramount, Calif.

Question: My Orchid Cacti dropped most of the buds this year. The plant appears somewhat shrivelled. Mrs. James Carr, Georgia.

Answer: Orchid Cacti when in good health and with the right cultural conditions do not drop buds. In the instance of your plant, however, the shrivelled condition of the "leaves" show that the roots are in bad shape or that the plant was kept too warm and dry during the winter. A close, sticky soil kept too moist suffocates the roots. These plants are epiphytic or grow where soil is scant as on rocks or barranca walls thus when you put them in a pot or can they do not take kindly to being practically drowned. Loosen up the compost with coarse leafmold and coarse sand or charcoal. This allows the air to penetrate freely to the roots. Allow the pots to dry out occasionally. This is a sovereign remedy for many cactus ills. Water regularly just as the soil gets reasonably dry. Don't continually fertilize them. Some plant food is necessary but feeding is easily overdone. They make their best growth during late spring and early summer. After the growth is completed be more careful in watering so the new stems can slowly mature. At first they are thin but as they mature the plant stores them with food and thus they become thicker and heavier. Then next year from these fat, food filled stems you will get an abundance of flowers.

Question: Recently I have noticed some white cottony substance on the growing points of several plants. Mr. Alec Robertson, Wisconsin.

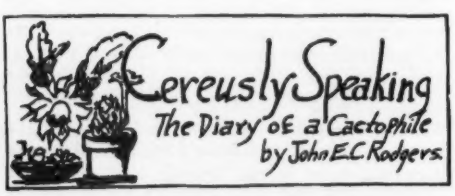
Answer: The cottony substance is the common mealy bug which attacks many kinds of plants. It does a great deal of harm and should be promptly attended to. If the plants are in pots lay them on their sides and apply a strong stream of water washing off as many as you can. Then use a good insecticide. Many insecticides if properly applied are quite effective. There are two kinds in general use for these sucking insects. One uses a contact poison such as pyrethrum, rotenone or nicotine. These are most effective when used with a "spreader" which helps penetration. The other type is an emulsified oil spray which kills by clogging up the breathing pores. My own preference is for a combination of the two such as Red Arrow Spray and Volck, the latter the oil type. This is very effective and kills every bug it touches. The catch is to apply it thoroughly. You may dip the plants in a bucket of the solution or you can apply with a hand sprayer. The more force with which it is sprayed on the better the kill. Make up a fresh batch each time you spray. Oil sprays are hard on members of the Crassulaceae and the Stapeliads.

Question: How do I increase my Mamillarias? Mr. Ronald Breitman, N. Y.

Answer: Some Mamillarias produce offsets which are easily rooted. Others branch freely as in *Mamillaria bocasana.* Cut the branches off with a sharp knife, dust the cut surface with sulphur or a rooting compound and let them dry in an airy place for a couple of weeks or so. Then plant them in a quite sandy, well drained soil. Water very sparingly for a month or so until roots are well formed. Some species are solitary or branch only by the crowns forking. These are best raised from seeds.

Question: I have had a Night Blooming Cereus for many years and have never had it flower. It has long slender stems that are almost round. Mrs. Clyde Fitch, Oregon.

Answer: Your plant is probably *Selenicereus Macdonaldiae* which is the one most often encountered. It likes about the same type of soil and treatment as do the Orchid Cacti. In fact many of the Orchid Cacti are hybrids between this *Selenicereus* and *Epiphyllum.* To get them to bloom well they need plenty of light and fresh air. In the summer they can be put outdoors where they get about half sun and half shade and the stems are allowed slowly to mature during the latter part of summer and fall, they will thicken up with stored food and bloom well the following year. A branch seldom or never flowers the same year it is produced. The flowers are so large it takes a lot of stored vigor to support them.



The awakening of my collection which I have tried to follow must soon give way to the slowing-up of growth either due to the heat of summer or to the conditioning of the tissues for adjustment to the shortening days and cooler night to come. This, of course, does not happen all at once anymore than the awakening did.

The Euphorbias have slowed up growth to such an extent that the new green has darkened to resemble the older growth. This slowing up is only temperary as there is a return to the growth cycle as the summer

heat wanes, which keeps on even into mid-winter, although I try to discourage it so as to avoid etiolation. This late summer slump is also found among the columnar cacti: They resent, almost to a species, the "terrific" heat wave we usually have from mid July to late August. The Pereskia, Pereskiopsis and leafy succulents all rest so that the new growth gets quite "hardened" in appearance. The growth cycle resumes but at a slower pace in early September and keeps on into early winter. Perhaps this slowing-up is more noticeable here in the Great Lakes region than elsewhere but most of us vacation, too.

Humidity usually averages in the uncomfortable 50's during July and August and partial shade helps to keep the succulents as well as the cacti from too much sunlight. September sees the return of light haze to the Lake region which helps to make it difficult to harden-off the plants stimulated by heavy dews and rains.

The excess of June moisture gave all of the outside potted plants several good soakings. This along with the "washing-in" of the vigoro had given the plants a thoroughly awakened look. May and June both had a small excess of temperature. These cool night (temperatures as low as 44°) did not seem to cause any slowing-up of growth on the Epiphytes outside but the day heat did slow those up in the greenhouse. These were budded and I did not wish to abort the smaller and not-so-well developed buds by changing the strength of the light; varying the temperature and drafts of air about them.

The combination of both days, cool nights and poor ventilation aborted the buds on several columnar cacti. The buds were under an inch long when the 90°-93° temperature hit in early June for four days.

The Parodias, Gymnocalyciums, Astrophytums, Mammillarias, and Echinocereus were not affected although the buds were not all set. Most of these plants have growth centers which push the buds away from the center as they develop. *Rebutia Fiebriegii* has a ring of blood-red blooms on last year's growth. Several fruits are set also, although I do not know whether the others have hybridized with it. There's enough confusion now without this happening. It does not offset for me. My plant is the size of a tennis ball with white spines. The offset I removed from the plant that refused to bloom blossomed. I was surprised that it was *R. violaciflora*. It is starting to offset the same as the original, but the offsets do not have long fusiform roots but are growing from the sides and are very globose.

The original was in a soil low in leafmold. I repotted the batch in decayed straw, cow manure and sand mixture. This mixture seems to suit the ones I have. I usually go to a farmer friend and get the cow yard mixture that gets churned and pushed out under the fence or too close to get "fresh ingredients" in it. Saves me mixing for Epiphytes and other leafmold and sand lovers.

My *Astrophytum myriostigma, A. ornatum,* and *A. capricorne* are flowering and budding as the new growth pushes the buds farther from the center. *Mammillaria rhodantha,* one of the larger and more vigorous species of the genus, has 3 forms of varying color from "reddish-pink" to black-brown. Two pots of six and eight headed *M. parkinsonii* have grown—but not bloomed although a small one labelled *M. "dealbata"* has several times—purple. Most of the "Mams" I own have been pot-bound for some time. The vigoro feedings seem to make-up for my "stinting" them in pot room.

One of the most fragrant flowers for its size I've found is the long slender stemmed flower of *Haworthia tessellata* and its varieties. It's a true lily perfume similar to Lily-of-the-valley. I've not trusted my nose only but those of collectors and visitors. I have a variety of Haworthia which resembles *H. "pilifera"* and *H. "denticulata"* which has the same fragrance. The fragrance is strongest on cloudy days and toward evening. As far as I can find there is no reference in any literature I've read to this distinctive characteristic. J. R. Brown's article in Volume IX, Pg. 159, Cactus and Succulent Journal, discusses *H. tessellata* but does not mention it either. I first discovered this fragrance about three years ago, but I did not wish to announce it until I had tested the other species I owned. There are no others than these I mention in my collection. What a boone to the otherwise insignificant Haworthia blooms that most people overlook or apologize for.

Have found glazed pots best for growth of Haworthias as well as other succulents. I watered three cacti in porous pots and two in glazed pots and left them stand for three days. The unglazed pots were dry while those in glazed pots were still moist. It cuts down on my labor but I'll hang on to porous pots—they're cheaper for one thing. The plastic pots in "jade-green," "flannel-red" and "jaundice yellow" are beginning to flaunt their colors in the collections of some of my cactus and succulent collecting friends but give me more artistic colors before I follow them. Why is it we must always go through this "gawd-awful" cycle before the designers give us plastics in pastels, and broken colors.

So far I've been successful double potting my "tendered" root types and I do have plenty of extra porous pots. This method preserves the moisture and keeps the variations of surrounding air temperatures more temperate. Echinopsis, Epiphyllums, Haworthias, Parodias, Malacocarpus, Aloes, Rocheas (Crassulas), Ceropegias, Huernias, Echeverias, Stapelias, Gasterias, Kleinias are only a partial list of those I've found respond to double potting. I've even resorted to Aluminumfoil. It works (florists use it in colors over cheap containers).

Still repotting plants in cramped quarters to next larger pot size, since they are through their flowering time, with ball of soil intact. This way I'm sure to get results and not make them blossomless next year. I do not believe in every year repotting sprees unless the plants are columnar types and gross feeders. Most cacti are starved, I'm told, and I've observed it in my own collection when I get over the jitters and apply fertilizers. Most of our usual ones are too rich in nitrogen and deficient in the rare trace elements.

Man has very nearly exhausted the upper soils (foot or so) of the earth's surface of its rare elements. The vitamins, food fads, etc., have been exploited both for man and plants. I even decided to try "Vitamin B-1" for my plants. Most users decided there was no benefit. Well, I was out a dollar back there, too. Author, super farmer Louis Bromfield, Malabar Farm, Lucas, Ohio, stated that plants with deep roots bring up the minerals man and animals need from the sub-soils. With his special grass diet (quickly dried while still green), he claims he is able to cure most of the cattle diseases even "Bangs Disease." We all know bugs-and-rare-mineral lack go hand in hand. Within the last few years man's diet deficiences have been studied and from the original 12 to 15 minerals and gasses we now know this should be nearer 33. It is evident the more we know about plants and soils the more trace elements we will find they need.

A few plant pathologists are studying cacti and succulents but the results have not been compiled.

"Yellows" results from insect-infested roots, but also from lack of potassium manganese (I use weak solution of potassium-permanganate to water the plants once in a while). It has restored a large *Euphorbia grandicornis* back to its greenness without changing the soil. "Chem-grow" both bottles for balance in solution, as directed for hydroponics, is another way of assisting our charges.

The last application of fertilizer to my cacti has been given and watered in. I do not believe it is advisable to go much beyond the middle of July. Growth is too soft for winter storage even in a greenhouse. We get plenty of rain here from September to the middle of October and that means more stimulus to plants I'm trying to keep from growing.

One of my six-year-from-cutting "Christmas Cacti" has put out "juvenile growth" stems. These resemble a 3 to 4 inch thickened stem of *Nopalxochia phyllanthoides* or a *Disocactus Eichlamii*. Although jointed, the stems have 10 serrations on each side containing brown bristles. Set me to thinking perhaps someone crossed our "long-disputed" *Schlumbergera Russelliana* with one of these I mentioned (Nopalxochia was cultivated and flowered in France as far back as 1811 according to Watson). The blooms of all three are pink, medium sized and non fragrant.

Give my collection a florist syringe sprinkling twice a week after a hot day both in the greenhouse and under the grape arbor. Found Dr. Henry Shetrone, Columbus, Ohio, used the water from the hydrant during the hottest part of the summer to spray his plants with. His collection always looks superb. Pays to copy the "old masters." When I spray I close the ventilators to conserve the moisture laden air. Smells good, too.

The all-in-one insecticide that we have asked for is almost here. Although I have not used it, Vincent Mason, Newtonville, Massachusetts, has and he is sure it is "It." It is sold under three names "Thiophos," "Parathion," and "Genethion." He has also used 50% wettable "Chloradane" for getting rid of floor and bench pests. Perhaps it is also good for keeping the neighbors cats from chasing birds across my greenhouse benches aand breaking plants.

My *Sedum Morganianum* (shave-tail variety the way I grow this so-called burro's tail) was examined by Dr. Meredith Morgan, introducer of the plant into the U.S.A., and he recommended partial shade. I grew it all winter in the full sun now I have it in the shade of the grape arbor and it is a lovely blue green instead of yellowish green. It blooms at the end of the longest stems, with 4 to 8 deep pinkish-purple-red blooms (not white as Mrs. Graves of New York reprinted in "From Here and There," May and June, 1951, Journal, Pg. 73).

Numerous Sedums in my rockery have also bloomed in white, yellow, and pink. *Sedum Sieboldii* (only Japanese succulent known, I've heard) growing in rock garden in full sun. Three "same-size-leaves" surrounded stems at one inch, more or less, intervals. In late August to early October the rose-pink blooms in clusters open. They are fragrant as Sedums go and beautiful. Grows in well-drained soil.

Opuntia compressa is through blooming and full of green fruits. Birds do not eat them and only once in a while when the snow is deep do field mice touch them, so these same fruits will become the progenitors of many more. They were water-logged for a month or more but still bloom.

Stetsonia coryne, the last one of the columnar cacti to start growth, has broken through the scar tissue on the top and it is doing fine. I shook up the soil, added vigoro and watered it thoroughly. It has begun growth after three years of negative reaction.

"To pot or not to repot" is still the question I'm asked most. I have repotted several that have grown slowly or not at all. Not one of them has reached maturity so the conclusion should be "they should grow." I knocked them out of the soil, examined the roots and depotted in a new and richer mixture. They evidently needed a change so I gave them that. Often just disturbing the roots helps. In other words better aeration, richer soil and larger pots are part of the picture, too.

The "rambling reporter" has spoken again. It seems to be an attempt to answer the cards and letters I've received this year since I ask for comments from my readers. Write me again.

JOHN E. C. RODGERS,
1229-8th Street, Lorain, Ohio.

ROUND ROBIN NEWS

There seems to be continued progress in our Round Robin activities. More letters are coming in and more Robins are on the wing.

I should like to take this opportunity to answer the two questions most frequently asked in your letters to me. Here they are:

1. *What is a Round Robin?* A Round Robin is also sometimes called a Club or a Circle. It is conducted entirely through correspondence. The letters go from one to another and each member adds his own and then mails all the letters on to the next until it has made a complete circle—then another round may be continued. Each Round Robin has a director who keeps track of the Robin's whereabouts during its flight, sees that the members' questions are answered by the other members, and helps to keep everyone happy and satisfied.

2. *Are there any Round Robin dues?* No, at least not at the present time. The only expense is postage. As I understand it, these Robins are being organized principally for our Journal subscribers as an added activity, and through this column I am able to keep you posted on the status of these Robins and to report on your individual requests for additional ones.

A few of you have written that since you have only just started a collection and own so few plants, you hesitate about joining a Robin. Don't let that keep you from joining. Whether you are a beginner or have been a collector for years, you will find membership in these Robins both informative and enjoyable. They are wonderful outlets for the enthusiastic Cactophile.

Here are a couple of interesting tidbits I have gathered from letters.

A unique way to make a dish garden is given by our Canadian member of Robin No. 2, Mrs. Chapman of Empress, Alberta. She writes: "Some of my dish gardens are made from a discarded dipper or saucepan cut down, then covered with putty and pretty, coloured stones pressed into it. Then it is varnished when the putty has hardened. Another way is to paint the can, crush egg shells fine, use crepe paper to colour them and then put them on the wet paint."

The Proctors of Witchita Falls, Texas, enclosed a picture showing a tall cactus growing in the corner of their living room which they bought in a variety store about six years ago. It has grown up to within a few inches of their 10½-foot ceiling. The top of the plant has been broken off on several occasions while tugging it in and out of their house so this rapid growth seems to have taken place mostly in the past four years. Mrs. Proctor writes that the plant may be a Peruvian Apple (Cereus peruvianus).

* * *

Cactus and Succulent Round Robin No. 4 has started

on its initial flight. Mr. James W. Garber of Covington, Virginia, is its director and with him in this groups are Mrs. Fred Guertin of Harrisville, Rhode Island; Mrs. Rose B. White of San Rafael, California; Mrs. C. A. Wooster of Detroit, Michigan; Mrs. Robert H. Major of Lenox, Michigan; Mrs. Florence Benston of Graham, Washington; and Mrs. Billie M. Anderson of Riesel, Texas.

Dish Garden Robin is winging its way around the country with Mrs. H. D. Schaefer of South Charleston, West Virginia, directing it.

The Lithops Robin hasn't had much enthusiastic response, but I have hopes for it. Some of you have written that due to your climate you have lost whole collections of Lithops and some of you are about ready to give up trying to grow them. Wouldn't this be a good time to get together and find out the "Whys and Why-nots" of these "little fellers?"

The first International Round Robin with a small group of four members has just been mailed overseas. It is an experiment which, if it proves successful, should lead to many more of them. In the group with me, besides Mrs. Anderson of Riesel, Texas, are Miss Phyllis H. M. Arundel of East Hardwick, Pontefract, England, and Mrs. W. J. Hillmer of TeAwamutu, New Zealand. We're not quite from the four corners of the earth but long distances apart.

Mr. T. Godwin, "Dunston House," Dunston, Stafford, England, has written that he would like to contact some Mesembryanthemum and Stapeliad fans and "swap notes." He mentions South African Mesembs, Lithops and others as among his especial interests. He also writes that at the moment he is beginning to collect Cheiridopsis, a genus which he says few people over there are interested in.

Several requests have come in for an Epiphyllum, a Zygocactus or some other single type of a Robin. These are rather difficult to organize and would take some time, so I presented this problem to our Editor. He has given me an intriguing name to cover all of these types, "Rain Forest Plants." This Robin will not only take in the plants mentioned but Rhipsalis and related epiphytes. Mr. A. Watkins of Spokane, Washington, has accepted an invitation to direct this Robin. It needs members.

The director of the Euphorbia Robin wishes we might have a few additional members. I have read the

Continued on next page

FIG. 81

When I see roof plants of *Lemaireocereus pruinosus* in Tehuantepec, I speculate on just how much root dryness these plants will tolerate. Tehuantepec, Oax., Mexico, has a minimum of six months of dry season, during which period not a drop of rain is expected. The average rainfall, during the balance of the year, is very light—and of course the tile roof is supposed to shed most of this.

T. MACDOUGALL.

letters in the first round and it is a splendid Robin. Mr. Frost of Florida, has given us sources where Euphorbias can be bought at reasonable prices, listed some smaller types that never grow out of bounds in a small apartment and has mentioned some good books to get on the subject of growing Euphorbias. Anyone want to join us?

This about winds up my report to you in this issue. Good flying to all!

MABEL H. FAY
123 North Avenue
N. Abington, Mass.

MEXICAN CACTI AND OTHER SUCCULENTS

"Quinta Fernando Schmoll" in Cadereyta, Qro., Mexico, offer you the following collections in cultivated plants, which are easy to reestablish, at prices that include all charges on the Mexican border:

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Above specimens sent postpaid—cash with order. Minimum order—$2.00.

"World Famous"
ROCKING HORSE CACTUS GARDENS
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FROM MEXICO

My cactus price list of 1950 is still good for 1951. Please ask for it if you want to obtain interesting novelties in cactus plants.

FRITZ SCHWARZ
Apartado 347 San Luis Potosi, SLP Mexico

MEXICO CACTUS SOCIETY

Dear Mr. Haselton:

We have just formed a Cactus Section of the "Sociedad Botanica de Mexico" and wish to inform you of its organization and to offer our cooperation and assistance in any way relating to the cacti of Mexico.

In addition to the gathering together each month of persons interested in these plants, it is our intention to publish a small bulletin quarterly and to use our influence as far as possible toward the understanding and conservation of this flora by the public in general.

We shall appreciate very much any advice you may be able to give us regarding the functioning of our Section and any other suggestions you may have to offer.

HELIA BRAVO H.
President of the Section

EDITOR'S NOTE: We will devote space in our JOURNAL to publicize this new Society and render any help they may need. An organization in the cactus country can render a great service by checking type localities, making herbarium specimens, and completing descriptions of vaguely described plants.

Recent Articles by Ladislaus Cutak

Fashions in Succulents appeared in the May 3 issue of The Florists' Review. The use of succulents in dish gardens, desertariums, for button gardens, corsages, and even for hat ornamentation, was interestingly pictured and discussed.

Agaves—Potential Source of a New Drug appeared in Missouri Botanical Garden Bulletin, April, 1951. "Cortone" is the trade-name for cortisone which is chiefly made up of desoxycholic acid which is used as a fatigue hormone injection. Mr. Cutak described the Agaves and told of their other uses.

USDA Book on Trees

Southwestern Trees, A Guide to the Native Species of New Mexico and Arizona. Agriculture Handbook No. 9. Available from Superintendent of Documents, Washington 25, DC. Send 30c coins, not stamps.

Book of Cacti for the Amateur Collector—Lawson. Contains 278 small pictures of cacti—the sizes and kinds usually found in collections. Tells how to plant cacti in pots or rock gardens. Diseases, watering, and general information. Postpaid $1.25.

Cactus Album—Duursma. This book in Dutch contains 142 pictures of cacti in color, tipped in similar to "Cactus" by Van Laren. This album contains many succulent pictures and makes a fine companion volume for the Van Laren books. Only one copy available, $12.50 postpaid.

Greeting Cards—12 of the famous Proctor pictures rendered in color. For correspondence or greeting to that cactus friend. Makes a fine gift box. Also a box with "Christmas Greetings" printed on each of the 12 cards. Postpaid $1.15 per box.

Backeberg's *B. F. K.* (*Blatter fur Kakteenforschung*). This bulletin of cactus research was published between 1934 and 1938 and contains 460 pages and 250 photos. Each cactus is described in English. The most valuable material since Britton and Rose. Absolutely necessary for those studying classification. Unbound $4.95, foreign $5.15.

Succulent Plants—Jacobsen. The revised edition of the most complete book on the other succulents is now available. There are over 300 illustrations with descriptions of 1000 species; mentions as many more in the 293 pages. English edition $6.15.

Plus Sales Tax in California

Abbey Garden Press, 132 W. Union St., Pasadena, Calif.